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ABSTRACT

This report contains a synthesis of key themes and issues discussed within each question posed to panel members at a roundtable on the changing Canadian research landscape. The keynote address, "Knowledge, Innovation and International Cooperation: The Sisyphus Challenge," by Francisco Sagasti, is presented in its entirety. Canadian researchers involved in research in the South find that the uncertainty of the policy environment and the instability in resource availability often disrupt research and development initiatives. The report then summarizes the conversations in panel sessions: (1) "The Opportunity and the challenges of North-South Collaboration"; (2) "Operational Issues"; and (3) "Outside Perspectives." Among the ideas and issues that emerged were the concept of "research diplomacy" as a potential new dimension of Canadian foreign policy. It must be recognized at the national policy level and at individual Canadian universities that Canada's national interest is served through collaboration with Southern researchers. Any approach for increased collaboration must recognize the complexity and heterogeneity of Southern partners in terms of research capacity, strengths, and development needs. Three appendixes contain background information, a summary of campus-level roundtables on the internationalization of Canadian research, and a list of roundtable participants. (SLD)

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FINAL REPORT

RESEARCH WITHOUT (SOUTHERN) BORDERS

THE CHANGING CANADIAN RESEARCH LANDSCAPE

A national roundtable on new directions in international research in Canada

May 22–23, 2003

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Note to reader

This report does not represent a verbatim account of the roundtable proceedings but is instead a synthesis of key themes and issues discussed within each question posed to panel members. In one instance, for the ease of readers, we have combined the responses to questions 4 and 5 in Panel 1. We have also attached the roundtable agenda to provide information on the structure of the roundtable and to introduce the panel members and interviewers.

The following documents are attached as appendices: AUCC's backgrounder on trends in international research collaboration in Canada, a summary by IDRC of the campus-level roundtables, and a list of the national roundtable participants and their affiliations. For further information, please go to AUCC's Web site, www.aucc.ca, where the slides of the keynote address as well as two presentations from Panel 3 are posted in the language in which they were delivered.

Preface

Several recent Canadian initiatives have highlighted the role that science and technology will play in Canada's future social and economic development. Notably, the innovation strategy emphasizes how knowledge creation and dissemination are central to strengthening the Canadian economy. Increased funding to the granting councils and new structures such as the Canada Research Chairs, the Canadian Foundation for Innovation and the Canadian Institutes for Health Research also signal that the research landscape in Canada is under renovation.

At the same time, there has been a growing sense in Canada of the importance of international research collaboration, marked by the report commissioned in 2000 by the Advisory Council on Science and Technology on Canada's international S&T activities, as well as the creation of new funding programs and policy changes at certain research granting councils to facilitate international partnerships. This policy-level emphasis on science and technology as a key element for Canada's development, along with a growing interest in international research collaboration among Canadian researchers, suggested that the time was right for a discussion on the role of North–South research collaboration in the Canadian context.

The International Development Research Centre (IDRC), with its mandate for research for international development, has been particularly concerned to ensure that the increased internationalization of Canadian research includes the developing regions of the world. The issue of university research has also been an ongoing priority for the Association of Universities and Colleges of Canada (AUCC), which has endeavoured to ensure that several key elements are in place to secure the foundation for a healthy university research effort well into the future. In a globalized environment where the line between domestic and foreign policy is a false divide, the international — and Southern — dimension of Canadian research is becoming increasingly important.

IDRC and AUCC joined forces to explore the key issues related to research for development within the increased internationalization of Canadian research. In the fall and winter of 2002–2003, approximately 15 universities across Canada held campus-level workshops providing guidance for a national roundtable held on May 23, 2003. The national event attracted over 30 vice-presidents, research, from Canadian universities and 25 senior officials from the research granting agencies and other national research establishments, federal government departments and NGOs in Ottawa. Panel discussions explored the opportunities, challenges and operational issues before Canadians seeking research collaborations with their counterparts in the developing regions of the world. The roundtable

was enriched by the viewpoints of international panelists from Peru, Kenya, the United Kingdom and Norway.

This report captures what was a preliminary discussion among key players on this important issue. It represents the beginning of a conversation that will take place in other fora as Canadians — including researchers and policy-makers — continue to reflect on Canada's place and role in the world and the coherent policy framework necessary to support this engagement. A range of views were expressed by the panelists and audience members at the roundtable, and this report presents the key threads of what was an interactive and animated debate. A number of compelling ideas and issues emerged, including the following:

- the concept of "research diplomacy" is a potential new dimension of Canadian foreign policy;
- Canada's national interest is served through collaboration with Southern researchers, and this must be recognized at the national policy level, as well as at individual Canadian universities;
- any approach for increased collaboration must recognize the complexity and heterogeneity of Southern partners in terms of their research capacity, strengths and development needs;
- young Canadians are the future Canadian research leaders and must therefore be more fully engaged in this discussion and process;
- the role of the Canadian private sector and of relevant Canadian and Southern NGOs as key stakeholders needs to be considered as well;
- operational issues must be considered hand in hand with the policy changes and investments needed to facilitate research collaboration with the South.

Finally, there was a clear call for more federal engagement on this issue and the need for comprehensive vision and leadership at the highest levels to elevate Canada's innovation strategy and research capacity to serve the global public good, a direction that is ultimately in Canada's own strategic interest.

We are pleased to offer this summary of the discussions.

Christopher C. Smart
Special Advisor
Special Initiatives Division
IDRC

Karen McBride
Vice President
International Affairs
AUCC

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Research without (Southern) Borders:

The Changing Canadian Research Landscape

A National Roundtable on New Directions in International Research in Canada

Thursday, May 22 (evening) and Friday, May 23, 2003

May 22

Thursday

Opening Dinner

The Empire Grill, 47 Clarence Street

5:45 p.m.

Bus departs Minto Place Suite Hotel from Laurier Street entrance (for out-of-town participants)

6:00 - 6:30 p.m.
Reception

6:30 p.m.
Welcome

Maureen O'Neil, President, IDRC

6:40 - 8:00 p.m.
Buffet

8:00 - 9:00 p.m.
The Sisyphus Challenge: Keynote address by Dr. Francisco Sagasti

Developing nations face a never-ending challenge to build and sustain their capacity for science and technology research — what Dr. Sagasti calls the Sisyphus challenge. Drawing on his work on knowledge systems, he will argue that North-South research collaboration is no longer a matter of aid or an act of good will. The challenges confronted in a globalized world lead Dr. Sagasti to argue that North-South research collaboration is an inevitable reality for the nations of the North and that universities are key national institutions in making these strategic choices.

9 p.m.

Bus returns to Minto Place Hotel

Biographical note on keynote speaker

Dr. Francisco Sagasti is currently the President, FORO Nacional/Internacional (since 1993), an institution which aims at promoting dialogue, debate and consensus on critical development issues, and also Director of AGENDA: Perú, a project on development strategies.

His career to date has included a range of senior posts: Chief of Strategic Planning at the World Bank (1987 90); Chairman of the United Nations Advisory Committee on Science and Technology for Development (1988 89); and visiting professor at the Wharton School of Business, University of Pennsylvania. Dr. Sagasti was also advisor to the Peruvian Ministers of Foreign Affairs and Planning.

Dr. Sagasti is a member of numerous boards and committees including: Rector's Advisory Committee of the United Nations University; UNESCO Science Policy Advisory Committee; and the Board of the Peruvian National Council for Science and Technology.

Dr. Sagasti obtained his PhD at the University of Pennsylvania. He received the United Nations Peace Medal and the Paul Hoffman Award of the Society for International Development for his "outstanding contributions to national and international development" (1980). He has published numerous papers and books on science and technology policy, systems analysis, management sciences, futures research and development strategies.

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Thursday, May 22 (evening) and Friday, May 23, 2003

May 23

Friday

National Roundtable

International Development Research Centre
14th Floor, 250 Albert Street

8:30 - 9:00 a.m.
Light Continental Breakfast

9:00 - 9:15 a.m.
Opening Remarks

Robert Best, Vice-President, AUCC; **Chris Smart**, Special Advisor, IDRC

9:15 - 12:15 p.m.
Session 1 - The Opportunity and the Challenge

Panel members with diverse perspectives will share their views on the premise that Canada's national interests are linked to the South's development and explore the opportunities and challenges this linkage may pose for the Canadian research endeavour in terms of public policy, university strategies and individual researchers' agendas. An "interview" format will permit lively dialogue among panel members, as well as allow the audience to be involved in the discussion from the outset.

Panel members
Howard Alper, VP Research, University of Ottawa; **Edna Einsiedel**, Professor, Communications Studies, University of Calgary; **Peter A. Hackett**, VP Research and Technology Development, National Research Council Canada; **Stan Kutcher**, Associate Dean International Medical Development and Research, Dalhousie University, Faculty of Medicine; **Nils Petersen** VP Research, University of Western Ontario

Interviewers
John De La Mothe, Researcher, School of Management,University of Ottawa; **Eva Egron-Polak**, Secretary General, International Association of Universities

10:45 - 11:15 a.m.
Coffee Break

12:15 - 1:30 p.m.
Buffet Lunch

1:30 - 2:45 p.m.
Session 2 - Operational Issues

In the past year, IDRC collaborated with a number of Canadian universities to convene campus level roundtable meetings to examine the day-to-day concerns that may be barriers to collaboration with developing country researchers. A number of important topics were highlighted in these discussions such as institutional culture, practices and standards, as well as national policies and regulations for research funding. Panellists will be interviewed about key operational issues that surfaced in their campus-level roundtables, as well as in their own experiences. Audience members will be encouraged to join this dialogue to offer their own reflections on challenges and possible solutions.

Panel members
Will Coleman, Canada Research Chair in Global Governance and Public Policy, McMaster University; **Bryan Harvey**, Acting VP Research, University of Saskatchewan; **Eva Rathgeber**, Joint Chair of Women's Studies, University of Ottawa/Carleton University; **Martin Taylor**, VP Research, University of Victoria

Interviewer
Gilles Breton, Director, International Office, Université Laval

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Thursday, May 22 (evening) and Friday, May 23, 2003

2:45 - 3:00 p.m.
Break

3:00 - 4:45 p.m.
Session 3 - Outside Perspectives

The potential role for North-South research collaboration in industrialized countries' national research agendas and developing countries' development efforts is a question that other stakeholders are beginning to reflect upon in more depth as well. From a Southern perspective, what do developing country scientists see as the model for collaboration with Northern researchers? How do other countries like Canada view the challenge of creating a strong research presence on the problems that affect the majority of the world's population? Panel members will provide outside perspectives on the theme that launched the day's roundtable discussion: the opportunity and the challenge of North-South research collaboration.

Panelists
Dr. Calestous Juma, Director of Science, Technology and Innovation Program at the Center for International Development at Harvard University; **Mr. Paul Spray**, Head of Research, Department for International Development, United Kingdom; **Dr. Andreas Steigen**, Director, Centre for Studies in Environment and Resources, University of Bergen, Norway

Moderator
Tim Dottridge, Director, Special Initiatives Program, IDRC

4:45 - 5:00 p.m.
Final Comments

Rohinton Medhora, VP Program and Partnership Branch, IDRC

Biographical note on international speakers

Dr. Calestous Juma is Professor of the Practice of International Development at Harvard University's John F. Kennedy School of Government and the Director of the Kennedy School's Science Technology and Innovation Program. He is a former Executive Secretary of the United Nations Convention on Biological Diversity and Founding Director of the African Centre for Technology Studies in Nairobi, and serves as Chancellor of the University of Guyana. He has served on several committees of the National Academy of Science (NAS) on science advice for sustainable development, geographical information sciences, and biotechnology. He is coordinator of the United Nations Millennium Project's Task Force on Science, Technology and Innovation.

Mr. Paul Spray is the recently-appointed Head of Research in the Policy Division at the UK Department for International Development. His team has been established to pull together all the research centrally commissioned by DFID, moving from its previous separate sectoral programmes. He will be producing a new research strategy for DFID during the year. He was previously head of DFID's Nigeria office, and before that worked as an Economic Adviser on DFID's relations with the IMF and the World Bank focussing on debt and poverty reduction. Before joining DFID in 1997, he was Policy and Campaigns Director of Christian Aid, the development agency of British and Irish churches. He has an M.Phil in Development Studies.

Dr. Andreas Steigen is Director of the Centre for Studies of Environment and Resources at the University of Bergen in Bergen, Norway. He chairs the university's Council of Development Related Research and Education and is a member of the NORAD Scholarship Committee. He is also in charge of implementing the Framework Agreement between the University of Bergen and Makerere University in Kampala, Uganda which involves nine research projects in chemistry, mathematics, physics and science education at Makerere University.

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Keynote address — Knowledge, innovation and international cooperation: the Sisyphus challenge

Summary of keynote address[1] by Francisco Sagasti, Director, AGENDA, Peru

The challenge of Sisyphus, who was condemned by the gods to forever push a rock to the top of a mountain, illustrates the challenge faced by people involved in development research. Although all researchers face the Sisyphean challenge, researchers involved with the South face an especially difficult challenge to create, consolidate and sustain capacity for science and technology research capabilities. Pursuing science and technology research anywhere requires a minimum level of research capability, and it is a never-ending quest to keep up with advances in science and technology to maintain this capability. In the South, the uncertainty in the policy environment and the instability in resource availability too often disrupt research and development initiatives.

Endogenous and exogenous research capacity

An endogenous science and technology base plays a critical role in a country's development process. Unfortunately, very few countries have been able to achieve this capacity. It requires a certain minimum level of domestic scientific research and technology development capacity, as well as modern productive and service activities. It also requires linkages with international sources of knowledge and technology. Countries in the South and countries with a small population base will only achieve an endogenous science and technology base if they gradually build their capacity in carefully selected areas.

Countries with an endogenous scientific and technological base, mostly in the North, have science, technology and productive sectors that are interactive as well as integrated. The technologies developed in these countries emerge from a research process and systematic experimentation. Science gives rise to technology, which in turn enhances production, and each component in the cycle influences the other components.

In contrast, countries with an exogenous scientific and technological base, mostly in the South, have separate scientific, technological and productive sectors. These sectors do not interact. In addition, there is a modern as well as a traditional element to each of the science, technology and productive capacities. Some of these elements have come from abroad and were not developed internally. As a result, "techniques" exist but not

[1] The presentation was based on the manuscript of a book, *The Sisyphus Challenge: Knowledge, Innovation and the Human Condition in the 21st Century*, to be published in 2004 by Edward Elgar Publishers, United Kingdom.

"technology." In this environment, change results from trial and error, not from systematic experimentation. Although this approach is sufficient at the local level, it is less effective than a consciously integrated science and technology system at the national level.

Changes in science, technology and production

The start of the 21st century is marked by major and simultaneous changes in science, technology and production. Changes of this magnitude have not been seen since the modern era began about 300 years ago.

Changes in science. Changes are occurring in the dominant knowledge framework, in the way knowledge is generated, and in the way science is conducted. Modern era premises such as the infallibility of the scientific method and the belief in linear progress are now being challenged. The very nature of scientific research is being transformed, with powerful effects on its applications, settings and costs. Science is now more expensive, increasingly linked to application, and increasingly undertaken by the private sector. These changes have considerable implications for Southern countries.

Changes in technology. Even the process of technological change has been transformed. The convergence of technologies has resulted in increasingly more actors being involved in a single research enterprise. Prior to the 1970s, individual, entrepreneur-style researchers were common. Now the process is much more integrated and systematic, requiring patent lawyers, venture capital experts, management consultants, and information experts. This increasing complexity poses management challenges at the enterprise and university level as well as for the management of the science and technology agenda. The final outcome of the technological transformation has been the emergence of "national innovation systems" that work in an integrated manner.

Changes in production. At the same time, staggering changes occurred in world production systems and in the techno-economic paradigm. The geographic location and content of productive activities have shifted significantly. Indeed, half of the goods traded today did not exist 20 years ago. For instance, the production and trade of knowledge-intensive goods have increased significantly. No longer organized around cheap oil as the key input, production is now organized around the microchip. This key, abundant and inexpensive input has changed the relevance of many economic concepts. Notably, information technology and computer-based production have made economies of scale irrelevant.

In spite of this fundamental revolution, traditional knowledge, techniques and production continue to have an important role in the world today. As many as two billion people do not have access to electricity and live largely outside the paradigm shift just described. Societies also exist where non-market exchanges based on prestige and reciprocity take precedence over the market place. This non-market approach, largely found in the South, is especially useful to address a range of issues — such as environmental concerns — which are difficult to address through conventional market mechanisms.

The North–South knowledge divide

Technological disparities between the North and the South are shockingly evident when economic indicators of countries are plotted against scientific and technological indicators. In general, the GDP of OECD countries is 64 times larger than the GDP of low-income countries, while scientific output is 88 times larger, technical output is 197 times larger, and technical production is 645 times larger. When India, one of the most successful Southern countries, is removed from the low-income country category, the situation in the developing-country index deteriorates further. In the absence of India, the average OECD country produces 331 more scientific papers per capita (a measure of scientific output) than a low-income country. With India, this figure is "only" 88 times greater.

While these figures clearly show the magnitude of the knowledge divide between the North and the South, there are also vast disparities in the abilities of countries in the South to generate and use knowledge. These disparities can be measured by a science and technology capacity index, which classifies Southern countries in one of four categories depending on their science, technology and production capabilities. The differences among the four categories are sufficiently large to warrant different approaches and strategies for addressing the specific issues inherent to each category of countries.

When this science and technology capacity index is plotted against the human development index, a broader picture emerges. Countries with a low ranking on the human development index fall in the lowest category on the science and technology capacity index. Thus, there is a high correlation between countries' human development index and their level of endogenous science and technology capacity.

Strategies for bridging the divide

Despite this startling knowledge divide between the North and the South, development programs to build science and technology capabilities have been relatively scarce. Moreover, the few programs that have existed have generally been relatively unsuccessful, with the notable exception of IDRC programs.

A number of strategies would assist in reversing this trend and building the endogenous science and technology capacities of Southern countries:

- develop knowledge, innovation and research networks that are mutually beneficial to the North and the South;
- return to strategy in development thinking and practice;
- achieve a balanced perspective with respect to the roles of the state, the private sector and civil society;
- consider non-market approaches to solve global issues.

The principles necessary for a comprehensive development strategy include the need to ensure that:

- efforts are sustained over the long term;
- selectivity is practiced because of resource scarcity;
- science, technology and production are integrated; and
- a learning approach is employed.

Policy instruments for building endogenous science and technology capacities belong to three main categories:

- developing science, technology and innovation capacities;
- creating linkages between domestic science, technology and production and their external counterparts;
- establishing a favourable environment.

These approaches must be applied differently depending on the type of developing country.

Why do research with the South?

For many reasons, the North cannot ignore the knowledge divide and carry on independently of the South.

First, the North faces a number of ethical and moral imperatives for undertaking research with the South. Improving living conditions, reducing poverty and preventing "knowledge apartheid" are but a few examples.

Second, the North faces global imperatives for research cooperation. A number of global public goods are at stake, whether the environment, health or biodiversity, and it is imperative to involve the South in solving these issues. It is also imperative to build capacity in the South to address developing-country problems that will impact on both the North and the South.

Third, enlightened self-interest is another motivation for undertaking research initiatives with the South. Canada, as a Northern country, stands to gain in tapping the global knowledge pool, having access to new problems and research topics, increasing its knowledge, building special ties with Southern countries, and revitalizing its academe.

The Canadian academic community — including AUCC and IDRC — enjoys a special and privileged position in the world. It therefore has an obligation to demonstrate international leadership in bridging the knowledge divide. Cooperation with the South will not happen automatically, however. It requires that all partners make a determined effort. It also requires a change in rules pertaining to financing, information dissemination and evaluation, incentives to motivate the various actors, and programs to facilitate and create collaboration.

Panel 1 — The opportunity and the challenge of North–South collaboration

In this first panel, five panelists with diverse perspectives shared their views on the premise that Canada's national interests are linked to the South's development. They explored the opportunities and challenges this link may pose for the Canadian research endeavour in terms of public policy, university strategies and individual researchers' agendas. An "interview format" permitted a lively dialogue among the panel members and allowed the audience to participate in the discussions.

Panel members

Howard Alper
VP, Research, University of Ottawa
Edna Einsiedel
Professor, Communications Studies, University of Calgary
Peter A. Hackett
VP, Research and Technology, National Research Council
Stan Kutcher
Associate Dean, International Medical Development and Research, Dalhousie University
Nils Petersen
VP, Research, University of Western Ontario

Interviewers

John De La Mothe
Researcher, School of Management, University of Ottawa
Eva Egron-Polak
Secretary General, International Association of Universities

The changing research context

The first question put to the panel was:

> *Is the world you have to deal with now very different from the world you dealt with when you began your research careers?*

Answers covered the increasing levels of complexity, the emergence of new technological tools, the rise of perplexing ethical issues, the creation of innovation systems, and the improved research capacity in the South.

Increasing levels of complexity. The new types of research being pursued are more complex and require increasingly high levels of collaboration. To solve a variety of interrelated problems, research teams comprised of scientists from an increasing number of disciplines, from a variety of institutions and from multiple countries are often interacting in large, highly collaborative teams.

This new approach to research results in more complex relationships, gives rise to different types of partnerships and requires a different type of researcher than 20 years ago. Back then, researchers collaborated with one or two people down the hall. Today, they need to build relationships and engage in negotiations, often in a cross-cultural context. Recently, for example, university centres of excellence have proliferated, thereby fostering multidisciplinary and interdisciplinary research. Although a positive step, these centres create management challenges.

At the same time, research is more often supported by a variety of funding agencies. The funding requirements for collaborative research and the new issues being researched frequently require more resources and different types of funding support than those provided before. But fundamentally, although collaboration has increased on specific research projects, the research process itself remains competitive.

New technological tools. New technologies such as the Internet have also brought about changes in the way research is conducted and published. With these technologies, research can more easily be undertaken in a highly collaborative effort, and papers can be authored by as many as 20 people.

Correspondingly, the pace of research has quickened. The increased speed does not necessarily foster creativity, however. Creativity is imperative, and universities in both the North and the South must nurture it.

Moreover, today's research tools, which did not exist a few decades ago, are increasingly complex and costly. Possessing these tools requires an increased investment in infrastructure and upfront costs. While difficult for a country such as Canada, this investment is too often out of reach for the South.

Ethical issues. A number of ethical problems arise from the new research agenda and the new style of research. Often, the issues studied implicitly relate to the South, although the researchers hail from the North. Issues of intellectual property often collide with indigenous knowledge. Nevertheless, positive changes have been made as well. In the past, little concern was given to the environmental impacts of research, leading to such practices as discarding chemicals down the sink. This would be unthinkable today.

Creation of innovation systems and links with industry and trade. Twenty years ago, academics had little connection to industry and certainly did not interact in partnership with industry on a daily basis. Nowadays, partnerships with the private sector are common currency. Indeed, a systemic approach to innovation has been developing.

Canadians are studying innovation systems, which have already had significant positive impacts on the country's development. This research must identify how institutions — the government, research-granting

agencies and universities, among others — can ensure that knowledge is created, innovation systems are developed and, ultimately, value is created and shared at both the national and the international levels. It is imperative for Canada to understand the conditions that were necessary in these institutions to support positive changes, and to reflect on the changes that are still needed to bring additional opportunities to Canada and other countries. Finding the answers to these questions is central to the transformation and development of Canadian society and thus must be a priority in the government's innovation agenda.

There are significant implications and challenges for Canadian society, institutions, business and industry, especially as they relate to the trade that is necessary to fuel the innovation agenda and the domestic use of knowledge that is mostly generated beyond Canada's borders. Ultimately, science and technology means trade, and vice versa. A paramount difference between the two is that science and technology is not subject to borders, whereas trade is.

Increased research capacity in the South. Initially, North–South interaction was driven by Northern altruism, and the adoption of Northern technologies constituted the framework for the exchange. Increasingly, however, Northern partners are asking, "What's in it for us?" Meanwhile, the level of sophistication in recipient countries has also increased, and any proposed technologies must be adapted rather than merely adopted. A shift has therefore occurred away from providing information and towards collaboration and building peer-to-peer partnerships. Issues of local ownership are no longer cut and dried.

A case for research partnerships with Southern countries

The second question proposed was:

> *Why should Canada include links with Southern countries in the scope of its international research agenda?*

Panelists' answers centred around three key reasons: increased diversity and creativity, mutuality of interests and a moral imperative.

Increased diversity and creativity. Canada needs foreign expertise and thinking to enrich its own activities. Innovation, ingenuity and creativity are obviously not limited to the North. Forging links with Southern countries would ensure that Canadian researchers are exposed to a richness of diverse perspectives, which would lead to different ways of identifying problems and a broader approach to solving them.

Often, problems that appear to be resolved can reappear as conditions change and re-emerge in a new form. New forms of disease are a prime example. Solutions to these problems can often be found in the South: the

scientific cultures of other countries improve our own. Canadians need to ensure that they do not replicate the thinking of the colonists who ignored local knowledge only to "discover" it 200 years later and call it their own.

Foreign students provide Canada with a pool of creative researchers during their stay in this country. Upon returning to their home countries, these students often develop research capacity, for instance local laboratories and infrastructure, some of which are world class. The ensuing collaboration with these overseas centres brings enormous value to Canada.

Mutuality of interests. Because science, unlike trade, is virtually borderless, it is important for Canada and other countries to align their mutual interests to ensure that development occurs. This suggests a model of collaboration and shared capacity building that will enhance wealth and value in Canada and other countries simultaneously. Such a model requires the identification of strategic alliances and attention to concerns about labour costs and International Monetary Fund debt reduction.

Canada must address the interests of Southern countries if it expects them to address the issues of importance to Canada. At the moment, Canadian researchers tend to collaborate with researchers in only a few industrialized countries. If Canadian scientific collaboration is to be broadened to Southern countries, Canada needs to commit to an agenda to build innovative capacity here and in those countries. Canadian researchers also need to identify what they have learned in Canada that can be shared abroad.

The Cuban "doctor diplomacy" model is worth emulating. Using physicians, Cuba linked its strategic interests with the strategic interests of other countries and used these linkages to further its foreign policy. Likewise, Canada could create a "research diplomacy" that would further Canadian diplomacy overall. To do so, it must first identify strategic alliances in which shared interests will benefit both itself and the foreign country. It may then use its research capacity as a diplomatic tool in support of its own foreign policy. This "research diplomacy" strategy would make building research and development capacity in the South a cornerstone of Canada's foreign policy.

Moral imperative. Despite these powerful reasons for establishing research partnerships with the South, some say the central reason for Canada to forge links with Southern countries stems from a moral imperative. This imperative does not preclude pursuing a strategy that achieves mutual benefits, however. Canadians could choose to develop linkages for either selfless or self-interested reasons, depending on the level of development of the Southern country. But Canadians need to be much more sophisticated in identifying their goals and must differentiate more clearly among the types of Southern countries. The world cannot simply be divided into North

and South. Indeed, the vocabulary that describes developing and developed countries needs to be updated and nuanced to ensure dignity and respect.

Niche areas for Canada

A third question presented to the panel was:

> *Given the range of opportunities, what are the niche (or comparative advantage) areas for Canada?*

Besides identifying a number of key areas where Canada could excel, panelists called for a greater international leadership role for Canada.

Niche areas. Some panelists suggested that niche areas could be identified based on where Canada has — or could have — leadership and where value can be added for Canada as well as other countries.

A number of possible niche areas — where Canada already has leadership — include human health, the environment, governance, public policy, regulatory systems, the role of women in society, disaster mitigation, business administration, education, banking, and specific technologies in food and construction. Health and environment are considered the strongest contenders. Canada can also use its bilingual and multicultural nature in addressing key social and cultural issues facing other countries. In this respect, the social sciences and humanities play an essential role.

Going beyond niche areas. In contrast, other panelists argued that there are very few areas where Canada cannot lead. In their view, Canada should not hide in niches but take an international leadership role by developing a strategy that focuses on creating knowledge and innovative solutions. Canada should distinguish itself by being "the country that leads in the development of a global innovative system for 'technologies' for human development."

For this to happen, a clear signal "from the top" is needed to indicate that this is the national intent. Canada may devote a percentage, say two or four percent, of its half-trillion-dollar innovative capacity towards issues of global human development. Special institutional arrangements and partnerships with the rest of the world may be required to deliver on this commitment. It may be worthwhile, for instance, to set up the "Canadian Institutes for International Development."

This broader innovative leadership approach would respond to several imperatives. First, it would help Canada to make the shift from the domestic front to the international front in the interest of collective security. Currently, the research and development capacity being developed in Canada focuses on Canada's domestic interests. A broader approach would acknowledge that Canada's interests are global. Second, the international community increasingly recognizes that this shift in priorities from domestic

to global is necessary and will occur. Canada should take an international leadership role during this shift instead of waiting for others to take the lead.

Canada needs to be an innovator, not an adapter or a follower. This is more likely to happen when Canadians are involved in addressing problems in other countries, which can then be applied to related problems in Canada. Similar problems exist in developing and developed countries. Canada could put together international consortia to leverage resources that would solve its problems as well as those found elsewhere. It could assume international leadership in important areas such as health and the environment, where leadership is currently lacking. Examples exist where Canadians have applied knowledge gained internationally to solving domestic problems. Thus far, however, this has happened as a result of serendipity, which is not sufficient. A conscious strategy is needed.

To be an effective — and possibly even a *leading* — contributor, Canada could identify an issue central to global health, such as biodiversity, the oceans or the atmosphere, which it is ideally positioned to tackle given its multicultural society, environmental knowledge and health expertise. The transformation of the research and development agenda requires Canada to choose which niche areas to pursue, develop action plans, identify milestones, then develop and market technologies. In addition to contributing to the global good, Canada would benefit from other countries' knowledge and experience in the process.

Challenges in international research and action steps required

The next two questions discussed by the panel dealt with the challenges of international research and the action steps required to meet these challenges:

> *Given the strategic opportunities, what are the challenges faced by Canadians wanting to take on international research? What actions steps could be taken — by the universities, granting councils, CIDA and IDRC, as well as at policy levels — to meet these challenges?*

The panelists discussed at length ways to address the many challenges surrounding international development research at both the institutional (university) level and the national level.

Institutional challenges

Recognition. The greatest challenge facing universities is the need to properly recognize researchers who are interested in international development research. Applied development research is not given as much value as disciplinary research. Universities should therefore include an international component in their planning and reporting exercises, at both the individual researcher and the institutional levels.

Incentives for young researchers. Encouraging and rewarding international research are also key to addressing another major obstacle to international development research. Often, young researchers who wish to undertake international research risk being penalized by the tenure system, which downplays and therefore discourages this type of research. There is no shortage of interest in international development research among young faculty, however. An international creative research development competition that was recently held at the University of Ottawa received most of its applications from people under 40. Adapting the university reward system to meet the challenges of the 21st century is therefore essential. And increasing the representation of young researchers in fora such as this one would be an important way to encourage development research.

Barriers to engaging in international research could be significantly reduced by enhancing young-researcher exchanges, providing seed money in the initial stages of North–South collaborative research, and developing student mobility initiatives at the undergraduate level to build long-term research connections and improve language abilities. Encouraging Canadian students to study abroad will ensure Canada has leaders and researchers who truly understand the global context. Japanese and European undergraduate initiatives are models for Canada to emulate.

Research priorities. One strategy for channelling young scholars' interest while maximizing the use of limited funds is to set university-level research priorities. At the University of Ottawa, all the research proposals that were considered in the international research competition had to align with university priorities. By doing this, the university ensures that it is able to make the necessary investments to reinforce its priorities — for instance, by allocating and developing research chairs as well as choosing institutional partners for collaboration.

Communication and awareness of opportunities. Surprisingly, members of the university community often lack knowledge about the international activities that are occurring at their own university. Universities need to enhance their ability to facilitate these intra-university linkages. In addition, it is often much easier for Canadian researchers to identify the research activities that are occurring in Japan and the West than in the South. Better information is needed on the opportunities for doing research with the South.

Other issues. Provincial issues, such as the pressures of the double cohort in Ontario, can have a constraining influence on institutions' international efforts. Yet universities, which are risk adverse, must embrace risk if they are to internationalize their research. International work is risky; it requires an investment and a long time frame.

National challenges

Government policy framework for international research collaboration. There is a need to develop — in the Prime Minister's office — a novel and imaginative multipronged international research mandate at the national level and create different mechanisms to support this mandate. International research collaboration in Canada has been limited by the domestic focus and funding incentives of the national research funding agencies and the innovation agenda. Although Canada is not currently at the forefront of the international research agenda, it has the potential to be a leader once again. To do so, it must address the research component of the global innovation agenda as a strategy for pursuing excellence and leadership. Some of the issues need further elaboration, including considering both marginalized and quickly developing countries at the individual, institutional, granting council and national policy levels.

Canadian institutions must change in response to the knowledge economy by positioning themselves to look forward. They must prepare themselves to deal with issues that will arise in the next 30 years, not the issues of the past. An announcement "from the top" is required to focus Canadian institutions on particular priority issues such as the environment and human health, and to encourage them to devote a percentage of Canadian capacity to these priorities. It is also important that institutions be organized to ensure that all international contributors can collaborate. This may require a new institute that can be networked globally to facilitate the creation of a global innovation system. At present it is difficult to come up with an innovative response because financial considerations are paramount.

International research and development calls for a strategic approach. This approach will emerge but will take time as it will be necessary to educate decision makers and build capacity in Canada and other countries. The long-term process will also involve bringing together existing institutions such as CIDA and IDRC, other key contributors to international research and development, and other stakeholders such NGOs, the private sector, and universities. All the key partners — including researchers under 40 who will be responsible for future research and innovation — should be at the table to help frame the imaginative new international research and development policy.

Canada needs to better integrate international research efforts into other public policy priorities. Many federal government activities, such as ensuring a clean water supply and protecting health, could be connected to IDRC and CIDA initiatives, for instance. It is important to invest in Canadian organizations that can connect with other countries to build capacity. Canada could be well-positioned to do this in areas such as HIV, malaria control and developing appropriate technology for health and agriculture.

Private-sector and civil-society linkages. There is a need to ensure that the private, public and NGO sectors are also included in Canada's international research agenda. Bilateral relationships could open up opportunities for the Canadian private sector. The Canadian government and private-sector research infrastructure could attract foreign participation and build the capacity for innovation in this country. Both of these strategies could help position Canada at the frontiers of international science and technology. Yet the public and private sectors face very real financial constraints, which have resulted in lost opportunities to participate in major international research initiatives.

There is a need for dialogue — not just on research, but on innovation, innovation systems, entrepreneurship and locating venture capital for international development opportunities. It is necessary to look at the larger system and identify how the transformation can be facilitated.

Fostering private-sector linkages is essential. There are several ways in which companies are collaborating, or could be collaborating, with other institutions to support development research. Examples include:

- a South African company that supports students' operational research costs while the country's national research funding agency supports the students;
- Canadian companies that invest in Southern countries could be nurtured to support international research and development;
- corporate boards in some Southern countries, such as China, Nigeria and Venezuela, seek out the best talent and create international networks for these researchers.

Foreign policy. Canada's ability to participate effectively on the world scene is waning because of declining funds and reduced foreign policy initiatives. While Canada has a small network of science and technology counsellors in key embassies abroad, its limited capacity for undertaking on-the-ground monitoring of trends and events in other countries constrains its ability to develop strategic perspectives, which ultimately affects foreign policy. An upcoming geographic review by the Department of Foreign Affairs and International Trade on science and technology priorities will identify new countries that share strategic interests with Canada and determine where the department should be allocating its resources in this area.

Canada's research and development spending as a percentage of GNP is low in relation to the rest of the industrialized world. Fortunately, the government has fixed ambitious targets to improve this figure. It is also important for Canada to have a research agenda as a part of its foreign and development-assistance policy. This "research diplomacy" would involve training researchers from Southern countries in Canada and ensuring that they have the necessary fixed capital assets when they return to their country of origin. Adequate infrastructure, including such basics as running water, is a prerequisite for research as much as for training.

Panel 2 — Operational issues

In the past year, IDRC collaborated with a number of Canadian universities to convene campus-level roundtable meetings. At these meetings, day-to-day concerns that may be barriers to collaboration with researchers in Southern countries were examined. A number of important topics emerged from these discussions, such as institutional culture, practices and standards, as well as national policies and regulations for research funding. In this session, panelists were interviewed about key operational issues that surfaced in their campus-level roundtables, as well as in their own experiences. Audience members joined this dialogue to offer their own reflections on challenges and possible solutions.

Panel members

Will Coleman
Canada Research Chair in Global Governance and Public Policy, McMaster University
Bryan Harvey
Acting VP, Research, University of Saskatchewan
Eva Rathgeber
Joint Chair of Women's Studies, University of Ottawa/Carleton University
Martin Taylor
VP, Research, University of Victoria

Interviewer

Gilles Breton
Director, International Office, Université Laval

Challenges in undertaking North–South collaborative research

It is the day-to-day issues that so often cause serious problems in international collaborations. Along with the campus-level roundtables that preceded this conference, this national roundtable underscored the fact that details are indeed a preoccupation. The first question put to the new panel helped bring out these day-to-day concerns:

> *What are the most trying problems for researchers proposing to undertake international research generally and North–South collaborative research particularly?*

The most trying problems identified by the panelists can be grouped in two categories: North–South partnership issues and Canadian policy and operational issues.

North–South partnership issues

Certain Canadian research government agencies, such as the Social Sciences and Humanities Research Council, have made policy changes to allow

foreign researchers to be part of the research team. Nevertheless, Canadian project directors sometimes face huge operational challenges dealing with the gulf between accepted Canadian protocols and the Southern reality, and these need to be kept in mind when developing policies to engage foreign (and Southern) researchers in Canadian research projects.

Different accounting practices. There can be issues about financial accountability and transferring funds to Southern universities. Some universities have no protocols and no research services offices. In one case, these problems were compounded by the fact that the Southern universities were highly fragmented, with relatively little contact between "loosely associated autonomous units." In addition, given the authoritarian and corrupt nature of the national government, the Southern partners would not have had any confidence in a university research support office, had one even existed.

Research ethics. Considerable attention is paid to research ethics in the research support offices and ethics boards at Canadian universities. In one project cited as an example, neither Southern university partner had an ethics board or protocol. The question of how the project should address the issue of research ethics was further complicated because the issue had to be framed differently in a non-democratic country.

Access to technology. The difference in communication networks is sometimes vast. Whereas Canadian researchers have access to the Internet, Southern universities are not always wired for it, although some professors are able to access it from home. This state of affairs often makes it difficult to integrate Southern co-investigators into a team built on modern technologies.

Cultural differences. In one project, none of these operational issues had been considered in advance by the Canadian granting agency or the Canadian university. It took the Canadian university research office, the Canadian granting agency, the chief Southern researcher and the Canadian project director three and a half months to negotiate an agreement. The Canadian university wanted to "nail down" every detail, which caused problems of trust in the cultural context of the Southern partner. It was obvious that the Canadian model of handling funds and addressing research ethics could not simply be transferred abroad.

Canadian policy and operational issues: institutional level

Policy issues, which were already discussed by the first panel, have an unmistakable effect on operations. Several issues at the institutional and national levels are thus explored anew and deepened further by the second panel.

Lack of networking opportunities. Communication inadequacies at the university level had been highlighted at the campus-level roundtables, which provided the university researchers working internationally with a unique opportunity to share information and network. Rarely, if ever, had a group ranging from assistant professors to senior-level researchers come together before to address these issues. Many were meeting for the first time, although they had a significant amount in common: their interest in international research and, in some cases, even specific types of research. Clearly, universities must assist their professors working on international research projects to network, mentor and share lessons learned.

Tenure and promotion system. The decisions about tenure and promotions do not reflect a genuine acceptance of the value of international research. Tenure problems seem more severe in the natural sciences and engineering and less so in the social sciences and humanities. In the natural sciences and engineering, publication demands are especially strong and reinforce biases against international development research. In some cases, university leadership in international development has come not from the university as a whole but from the professional schools, namely human and social development, education, business and law, where 80 to 90 percent of international research takes place. It is important to identify where in academe the blockages occur with respect to tenure and promotion. However, even in situations where tenure and promotion are not at risk, biases remain, and not enough recognition is given to international research in internal institutional communications and practice. It may be difficult, for instance, for researchers to publish interdisciplinary research, which is typical of international development research, in disciplinary journals.

Obstacles for young researchers. International research that involves North–South collaboration is not attractive to younger scholars seeking tenure and promotion. Young researchers face specific issues such as access to funds, career development, awareness of opportunities, availability of role models, mentoring, the issue of leadership, and biases against applied research. Senior faculty are reluctant to encourage young scientists to undertake international research without greater evidence of Canada's commitment to this type of research. In addition, because young researchers often have young families and spouses who work outside the home, the requirement for international travel can compound the difficulty.

Retirement of top international development researchers. There are concerns about the retirement of Canadian researchers who have been active leaders in international development research. The priorities of the faculty who will replace the retirees must be considered during hiring. Otherwise international research capacity will be eroded.

Inadequate infrastructure support and incentives. Besides information exchange, the major issues that emerged from the campus-level roundtables were infrastructure support and incentives. University biases against international research keep international researchers operating at the margins of the mainstream. Any successes result in an increase in workload with only a minimal increase in resources. Nevertheless, some progress with respect to infrastructure support has been made, with some universities now making funds available for proposal development, networking and building collaborative teams internationally. It is still difficult to access resources to develop complex proposals, however. This reflects the priorities of universities' international offices, which until recently tended to focus on exchange programs instead of international research.

Canadian policy and operational issues: national level

Low recognition for international research. The lack of national recognition given to international research accomplishments is another impediment. Both the awards process and the communication of results to the public and the university community favour domestic priorities over international priorities. For example, incentives continue to push researchers towards more traditional research. The federal government's major new investments have expanded mainstream programs, further marginalizing international research. University practices that reward researchers who obtain grants from Canadian granting councils — which currently focus on domestic priorities — discriminate against researchers who pursue international research. Researchers who obtain funds from the traditional granting agencies and who are successful in their research stand to obtain additional funds. This is not the case for development projects, where new funds can only be sought at the completion of a project.

Granting council focus on domestic priorities. Canadian research granting councils orient their support primarily towards Canadian researchers and are currently focused on domestic priorities. Although some have "opened the door a crack" to international research issues and foreign researchers, they have not addressed the issue in all its complexity. Positive changes have been made by allowing co-applicants from outside Canada, but if mutual exchanges are to occur between Canadian and Southern researchers, Canada must drastically change the structure of its grants to enable investments to be made in the South. It must also require participating Southern countries to support their indigenous researchers. As a promising sign, one national granting agency is running a global health competition that will be supporting the establishment of health networks abroad and is working to develop networks to address the issue of different accounting systems.

Lack of communication about funding opportunities for international development research. Communication inadequacies also place international development research at a disadvantage. Organizations funding international development research do not ensure a flow of procedural information to the same extent as the three national research granting councils. For example, information about how the funds for international research should be handled, such as cash flow, accountability and differences in accounting systems, is not widely circulated. Also, information about CIDA, IDRC and especially the World Bank funding sources is not well disseminated. The information about accessing these organizations tends to be sought at the individual level by researchers who have been successful in securing funds in the past. It would be better if the information flowed regularly from agencies supporting international research to the universities, particularly research offices, which are in the best position to effectively disseminate research information.

Examples of effective collaborations

The second question put to the panel was:

> *Are there examples of collaborations that have worked well and what can we learn from them?*

According to the panelists, effective collaborations are based on respect and dignity, mutual expertise and interests, and flexible arrangements.

Collaboration based on respect and dignity. For North–South collaboration to be successful, Southern expertise must be valued even when it is not construed in Northern terms. Rather than expecting Southern partners to adjust their points of view to the Northern paradigm, it is important to understand other views of the world, other ways of knowing, processing knowledge and bringing together ideas.

To ensure a respectful collaborative relationship, Canadian partners need to:

- learn that expertise exists everywhere;
- develop humility. This means listening, being willing to learn, and not believing that the Northern partners have all the answers. Respect for the knowledge and intellectual contribution of Southern partners is essential. Unfortunately, the equal sharing of the intellectual aspects of research work is rare. Too often, theorizing is undertaken in the North or by international centres — both of which are located far away from local scientists — and implementation is left to Southern researchers;
- provide Southern partners with access to more sophisticated knowledge rather than to existing knowledge that is "off the shelf";

- ensure appropriate levels of administrative responsibility. Southern institutions often do not have the infrastructure to manage Northern-style administrative practices. Expecting them to assume this responsibility burdens their fragile capacity. Instead, Northern partners need to provide resources to build the administrative capacity of the South, including an administrator who will be part of the research team and located in the South;
- share research funds equitably. Although Canada does this to a greater extent than many other countries, the majority of research funds still tend to be spent in the North.

Collaboration based on mutual expertise and interests. Collaborations that are successful and sustainable rely on the expectation of mutual expertise and interests and mutual learning where lessons learned and knowledge gained can also be applied in the North. Examples of successful projects that illustrate how knowledge moves and how expertise developed in the South can have an impact on Canadian knowledge systems include the following three cases:

- in some dispute-resolution projects, knowledge derived from the relationship between the Canadian government and First Nations has informed situations in the South, which have in turn influenced situations in Canada;
- the interdisciplinary nature of research centres on aquaculture development, which is a major issue on Canada's West Coast as well as in Thailand and Brazil, enabled the sharing of lessons with these countries about the development of the aquaculture industry and about the industry's influence on community health;
- a Canadian microbiologist who spent 20 years in Kenya working on a joint HIV project by the University of Manitoba and the University of Nairobi subsequently became the director of the Canadian microbiology laboratory that ended up playing a major role in the recent SARS outbreak.

Collaboration open to flexible arrangements. Successful collaborations often flow from creativity and flexibility, often in the form of in-kind services. An example was given for the innovative way in which a Canadian researcher bought services from a Southern researcher to support his plant breeding research, which proved to be synergistic and mutually beneficial. Instead of purchasing the services of a professional Canadian enterprise to grow crops off season to speed up his research, the researcher hired a Chilean colleague to grow Canadian barley seeds in a nursery in Chile. This arrangement added no extra cost to the Canadian researcher. As an added value, the plants raised in the South benefited from his Chilean colleague's

professional eye in selecting material and were screened for additional diseases that would be hard to find in Canada. For his part, the Southern colleague benefited from free access to the Northern plant materials as well as access to hard currency, which enabled him to attend conferences in the North.

Flexibility is particularly important in certain countries where universities are facing great challenges. In such cases, it may be a good idea to partner with civil society instead. Often, civil society partners can deliver quality research on projects that Canadian partners — for a variety of reasons — may not be able to undertake.

Research must sometimes be undertaken in very different ways in the South, often because of the increased levels of political risk that Southern researchers face. The differences are most likely to arise when the research results are applied and disseminated. Canadians need to remain sensitive to issues that may be controversial because of the political risk faced by Southern researchers.

Recommendations for universities, granting councils, CIDA, IDRC and others

The third and final question asked of the panel was:

> *If you could make one recommendation for universities, granting councils, CIDA, IDRC or others to remedy an operational issue, what would that be?*

Panelists voiced and reiterated their key messages for each stakeholder, as well as for the federal government.

Canadian granting councils. Although some welcome restructuring at the granting councils has occurred to enhance international research collaboration in conjunction with Southern researchers, further change is needed and must include the restructuring of programs as well as the undertaking of joint initiatives and collaborations among the granting councils, IDRC and CIDA. These types of changes would facilitate sustainable research projects, which are not currently possible.

If granting councils are to be included in the internationalization of research, a paradigm shift must occur in their granting processes as well as in the evaluation criteria used to measure the impact and innovative aspects of research proposals. It would also necessitate involving a greater variety of evaluators — including non-scientists. The paradigm shift would also require the development of a process for negotiating with Southern partners. IDRC has practical knowledge that it could transfer to the granting councils to assist them in operationalizing these issues. It might also be useful to build up a database on best practices in dealing with operational issues and challenges.

IDRC and CIDA. IDRC and CIDA need to foster better ways of working more closely with Canadian universities to build research capacity in the South. CIDA, for example, has much expertise and lessons learned to share with respect to capacity-building projects. In addition, these organizations need to foster broader networks within the university, namely by communicating with the research offices as well as the international offices.

Universities. For their part, universities need to develop integrated strategic plans to support research for development. These would include a full range of issues, such as undergraduate educational and curriculum change, student and faculty recruitment, as well as outreach and technology-transfer activities.

Federal government. The federal government needs to establish a clear policy framework for international research collaboration to send signals for other players to set their priorities. Currently, the government places a low value on the international research capacity that exists across Canada. Whereas other countries tap this expertise, and even use it to rethink development strategies, Canada does not take this capacity seriously. At most, it uses a small cadre of advisors and holds some scattered consultations.

A case in point, the federal government's representation at the roundtable was relatively low, in spite of the efforts made by IDRC and AUCC to secure its presence. In light of the impressive gathering of participants, including vice-presidents of research from universities across Canada, the low level of government participation was roundly criticized and a call for greater government commitment on this issue was made.

Immigration practices constitute a prime area for federal government involvement. Southerners face a number of barriers when they try to come to Canada for research or study. Mechanisms exist to assist Canadians to go overseas, but not to enable Southerners to come to Canada. For example, foreign research students, who play a key role in Canadian universities, face increasing tuition fees, which reduce their access to Canadian postsecondary education. The Canadian government could take the lead from other Northern countries, which have mechanisms such as scholarships or targeted research fellowships that facilitate Southern researchers' ability to go to other countries to participate in collaborative research.

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Panel 3 — Outside perspectives

The potential role for North–South research collaboration in industrialized countries' national research agendas and Southern countries' development efforts is a subject that other stakeholders are also beginning to reflect upon in more depth. From a Southern perspective, what do scientists in Southern countries regard as the model for collaboration with Northern researchers? How do other Northern countries view the challenge of creating a strong research presence to deal with the problems that affect the majority of the world's population? Three panel members provided outside perspectives on the theme that launched the day's roundtable discussion: the opportunity and challenge of North–South research collaboration.

The changing role of research in developing countries

Calestous Juma, Director of the Science, Technology and Innovation Program, Center for International Development, Harvard University

To establish strong linkages with the South, Canada must understand "where developing countries are going." Southern countries have the advantage of being latecomers to the development process and are therefore not as locked into systems and processes as are Northern countries. Thus, they have a "latecomers" advantage, which allows them to be more innovative.

Key development challenges in the South. Overall, Southern countries face three major development challenges. First, they must meet basic human needs in nutrition, health and education. Second, they must decide how to react to the pressure to participate in the global economy, including making decisions about whether and how to increase their participation in globalization efforts. Third, they must focus on sustainability during the transition, taking up an environmental management challenge.

These three challenges cannot be met without a significant investment in science and technology. And since it is impossible to deal with knowledge-based systems without dealing with universities, universities must form the core of the development process.

Southern countries must employ five strategies to respond to their development challenges:

1) improve the policy environment;
2) build human capabilities, especially by investing in education;
3) promote enterprise development, particularly by recognizing the role that the private sector can play in transforming knowledge into goods and services;

4) invest in research and development relating to Southern countries; and
5) look ahead and develop a vision for the future.

Some countries in the South are "prospecting" the body of knowledge available worldwide to identify technology opportunities that are relevant to their economies. Once the technologies are identified, the countries map out long-term scenarios to enable these technologies to be transformed into products and services.

Key research challenges in the South. Southern countries face major research challenges, including the use of existing knowledge, the generation of new knowledge, recombinant learning and institutional innovation. Unlike OECD countries, which emphasize the generation of new knowledge and innovation, Southern countries focus on using existing, publicly available knowledge to develop their productive capabilities. In the South, for example, patent offices are often used as important reference libraries to identify knowledge that is in the public domain. The differences between the two approaches are not always well understood, and this can create problems for North–South partnerships. Institutions must explore how they can use both approaches through recombinant learning — the combining of existing and new knowledge. This approach has implications for the kinds of institutions that are created and requires institutional innovation.

Diverse responses by Southern universities. Institutional creativity and innovation are thriving in Southern countries because universities are very diverse in their expectations, goals and functions. In addition, many institutional experiments are arising from the collapse of old structures, which, although difficult, presents opportunities. Some examples illustrate the variety and range of Southern universities' experimentation, innovation and creativity:

- the University of Singapore has established a campus in Philadelphia because many of its citizens live in the United States;
- a university in Zambia acts as the country's largest Internet provider, thereby turning demands on senior university personnel into an innovative opportunity;
- a university in South Africa is the only university in the world to run its own satellite and, as a bonus, it provides services to the private sector;
- in a Costa Rican university, students prepare a business plan as part of their course work and have it evaluated by a committee of advisors and investors. When they graduate, these students do not seek employment, they create it;

- Kenya is instituting a major reform of its vocational and technical postsecondary institutes. Rather than undertaking the initial reforms on a small scale, Kenyans are implementing reforms on a massive scale. The large number of experiments is expected to reduce the risk and enhance the ability of institutions to learn from each other.

Strategic entry points for Canada. The globalization of knowledge has created emerging opportunities for knowledge-based institutions and new roles for universities. Several strategic entry points exist for Canada as it seeks to improve its role in research for development:

- Visionary leadership at the national policy level is absolutely critical. Research for development must not be confined to the research councils or the universities alone. It must above all reflect the policy identity of Canada in the world.
- The national policy on research for development should be stable and engrained in Canada's policy in such a way that it is not liable to change whenever the national leadership changes.
- The national policy on research for development must be reflected in the way Canada articulates its foreign policy overseas. This policy becomes the message that Canada conveys to various international organizations that share this mission, such as the United Nations.

Emerging models to fund development research: Trends in the United Kingdom

Paul Spray, Head of Research, Department for International Development, United Kingdom

In Britain, three structures have the ability to fund development research. They are the higher education funding councils; research councils, which have recently received additional funds, as they have done in Canada; and the Department for International Development.

If the amount of development research in Britain is to increase, research incentives must be examined. One crucial area that clearly needs to be addressed involves increasing the rewards for research that has direct and useful applications. Although this objective is not currently part of the mandate of the funding councils, it is increasingly being addressed by the research councils. DFID and the research councils have expressed an interest in exploring this opportunity together.

The key reason for the limited research on technology aimed at reducing poverty is the lack of economic demand for these technologies. Poor people cannot create the demand on their own. Addressing this issue requires a discussion about global public goods. Can the international public sector assure an adequate demand for this type of public good? Although this

approach would require a shift in research priorities, it must be remembered that the public sector has played a successful role in creating the necessary demand for such products and services as vaccines, health standards and livestock.

The increased collaboration between the research unit at DFID and the research councils brings its share of issues. For the collaboration to result in synergy and not simply increase transaction costs, participating organizations must work together to develop joint themes and identify comparative advantages. The research councils have the ability to focus on rigour, which enables them to develop methodology for comparative studies. DFID, on the other hand, has convening power. That is, it has the ability to bring together the various stakeholders, such as researchers and policy makers, at different points throughout the research and development process, not just at the research-dissemination stage. DFID can help build and reinforce the linkages that are required if research is to have an impact on policy.

Case study of a Norway–Uganda research collaboration program

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In Norway, the national and university context supports North–South collaboration. This case study, which involved the University of Bergen in Norway and Makerere University in Uganda, demonstrates the crucial importance of institutional support, starting at the government level.

Norwegian government policy framework for North–South research. The Norwegian government has clear objectives and priorities for international research, as well as the organization and the mechanisms to support these priorities. At the NGO level, the Centre for International Cooperation (SIU) has a mandate to promote the participation of Norwegian educational and research institutions in international cooperation, whereas the Norwegian Council for Higher Education has a program for development research and education (NUFU) that is committed to building competence in research and higher education in the South. A NORAD scholarship program and University of Bergen internal initiatives have also provided important support, including free tuition and a living allowance for all foreign students; university seed money of about 5 million Norwegian krones,[2] which has leveraged approximately 100 million Norwegian

[2] One Canadian dollar is equivalent to 5.22 Norwegian krones.

krones; and a simple application and approval process for special funding from the university's international relations office.

Institutional policy framework for North–South research. At the university level, the University of Bergen has identified the internationalization of the university as a major focus of its strategic plan. The strategy mandates the university to strengthen its research collaboration with countries in the South, with a special emphasis on building institutional capacity.

Description of the collaborative research project. The collaboration between the University of Bergen and Makerere University began in the late 1980s, just two years after the war ended in Uganda. It started with the rehabilitation of the university buildings and other infrastructure that had been damaged by the war. The collaboration intensified in the mid-1990s and has been further strengthened since 2000 with the inclusion of the administration, libraries and finance departments as well as executive exchanges.

The framework for collaboration between the two universities provides a clear and formal agreement identifying the areas of cooperation and addressing the management and administration of the collaboration, dispute resolution, research and teaching, the exchange of staff and students, and funding and finance. The agreement has a long (15-year) time frame, considered essential for the success of the collaboration and the research.

The collaboration currently includes five major research initiatives at Makerere. The basic research initiative has nine subprojects ranging from capacity building and joint research in industrial and financial mathematics to environmental physics initiatives including a solar energy project. Other research initiatives include a network in pathology, the promotion of innovative community-based and clinical initiatives related to essential nutrition and child health in Uganda, and an interdisciplinary study of Lake Victoria involving more than 14 students and faculty studying issues related to ecology, social sciences, history and law.

Lessons learned for successful collaboration. A range of problems related to the collaboration have been entirely or partially solved. There are now budget lines for collaborative activities; a general research permit has been approved; communication and Web pages work; and issues concerning banking, insurance, exchange rates, purchasing, repair, transportation and the issuing of visas have been addressed. The major problem that remains is the disruption that occurs when other funding agencies lure away personnel, students and researchers with larger grants.

Overall, the University of Bergen – Makerere University collaboration is based on the careful and strategic use of financial resources in combination with a long-term commitment. The budget for the first 10 years of the

collaboration was only 12 million Norwegian krones, and the budget for the next five years will only be another 12 million Norwegian krones. The relatively limited funds are generally not an impediment because Makerere University departments do not have the institutional capacity to manage large budgets. In addition, the long-term commitment to scientific collaboration is viewed as a greater benefit than the size of the investment.

Collaboration is built on mutualism and cooperation, not aid. There must be benefits for all. It requires patience, persistence, long-term involvement and transparency. Gender issues must be addressed, and individuals who are not delivering must be replaced. In three words, successful collaboration requires commitment, dedication and loyalty.

The way ahead

Rohinton Medhora, Vice-President of the Program and Partnership Branch at IDRC, concluded the roundtable by reflecting on the discussions and identifying some next steps to move the agenda forward.

The overall concept emerging from the roundtable is that research is a public and collective good. Within this larger concept, the discussion focused on three facets. The first is the need to ensure that the changing research landscape, which is increasingly collaborative and multicentred, maintains its momentum. Second, the remarkable statistics about the huge imbalances of research capabilities and resources between the North and the South, and within the South, are a cause for dismay. The third facet is the strong commercial element of science and technology collaboration. This was reflected by two statements made during the roundtable: "science and technology is trade, and trade is science and technology" and "science does not get to market by itself."

Discussions highlighted the importance of nurturing creativity in the global research agenda and linking this creativity to the global good and human development needs. Attention was also given to developing a global innovation system, which was identified as an important element in the development research agenda.

Delegates expressed nostalgia for a period of Canadian openness and place in the world that has been devalued by recent Canadian policies. Other exchanges indicated that there were some differences among participants concerning the evolving role of universities in society and the pressures to take a utilitarian or broad-based approach to education and research.

Some elements require additional debate, including:

- the context in which universities operate;
- the role of other players, including NGOs in the South (which undertake a significant amount of research because universities and bureaucracies can be difficult places to work) as well as private-sector consultants and independent research institutes; and
- the belief that research improves the human condition.

These issues in turn lead to larger questions: "What are the environments in which research makes a difference?", "When can research make a difference?" and "What are the links between openness and research?"

Many of the discussions emerging from the roundtable were about identifying ways to improve the approach to development research. These are timely discussions, given that IDRC is in the initial stages of developing its 2005–2010 strategic plan. As a part of this process, it is undertaking an environmental scan of the Canadian research landscape and identifying the

implications for IDRC. Studies are being commissioned to assess the "tectonic shift" in the research environment to ensure that IDRC is aware of the changes.

Thus, the roundtable was not the end of the discussion but the beginning of a conversation that will continue in other fora, including the foreign policy review. IDRC will be a key player in this debate.

MAY 2003

RESEARCH WITHOUT (SOUTHERN) BORDERS

THE CHANGING CANADIAN RESEARCH LANDSCAPE

A BACKGROUNDER

Association of Universities and Colleges of Canada
Association des universités et collèges du Canada

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Introduction

The importance of Science & Technology (S&T) for a world that is prosperous, healthy and secure is increasingly recognized. Writing in *The Economist*, Jeffrey Sachs observed ". . . that participation in international assistance needs to be broadened and recast . . . and first-world universities and scientific establishments need to be engaged, and the official agencies charged with global development. . . ."[1] Several recent Canadian initiatives have highlighted the role that S&T will play in the future of Canada's socio-economic development. Notably, the innovation strategy emphasizes how knowledge creation and dissemination play a key role in strengthening the Canadian economy. However, this policy-level emphasis on S&T has yet to capture the role of international research collaboration for Canada. The focus on S&T as part of the strategy for Canada's development combined with a strong interest in international collaboration on the part of Canadian researchers suggest that conditions are now favourable to discuss the policy framework on North–South research collaboration in the Canadian context.

This document is meant to stimulate reflection on the role that Canada should play with respect to North–South research collaboration and capacity building in the context of a national roundtable being organized by the Association of Universities and Colleges of Canada (AUCC) and the International Development Research Centre (IDRC) in Ottawa in May 2003. It presents key facts to the reader on the current state of international collaboration undertaken by Canadian researchers, and it outlines the policy framework that facilitates this collaboration, with an emphasis on the elements pertaining to North–South research partnerships.

The paper will cover five main areas:

- It will first give a snapshot of science and technology patterns in developing countries with a view to highlighting key trends and issues for developing countries.
- The second section will present an overview of trends in Canadian international research collaboration based on bibliometric data, taking stock of co-publications with foreign partners as well as partnerships in research grants.
- The third section will review some of the recent trends and changes in the Canadian approach to research collaboration with developing countries. International research collaboration will be examined through two main conceptual categories: "research as foreign aid" and "partnership-based" research collaboration.
- The fourth section of the paper will focus on two case studies: the United States and Europe, where the respective policy frameworks on international research collaboration will be examined.
- The paper will conclude with key observations with respect to certain trends in the pattern of international research collaboration.

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[1] Sachs, Jeffrey, "A Map of the New World," *The Economist*, June 24, 2000.

A snapshot of science and technology patterns in the developing world

Many studies have underlined the link between S&T investment and economic growth in advanced industrialized countries.[2] For developing countries, evidence of this link is more limited.[3] Nevertheless, recent studies suggest that the ability of a society to use scientific and technological knowledge is central for sustained economic growth and improved quality of life.[4]

Despite the importance of knowledge for development, knowledge creation today is confined to a handful of countries. Advanced industrialized countries generate nearly 90 percent of world scientific output. The same countries also dominate patent registration and other forms of intellectual-property rights.[5] UNESCO estimates that global expenditure in R&D in 1994 was approximately $470 billion US. Of this, North America and Western Europe accounted for 37.9 percent and 28 percent respectively. Japan and the newly industrialized countries accounted for nearly 18.6 percent. Africa accounted for only 0.5 percent.[6]

According to the latest edition of the American publication, *Science and Engineering Indicators*, many developing countries are becoming increasingly active in the global scientific community.[7] However, the picture that emerges is uneven, both across and within regions of the developing world. Some key examples include:[8]

- Scientific activity has grown in parts of Latin America. Overall, the number of scientific papers published by Latin American scientists more than doubled between 1986 and 1999. But nearly all of this output was concentrated in Argentina, Brazil and Mexico, which generated nearly 80 percent of the region's articles in 1999.
- Scientific output in sub-Saharan Africa fell by 20 percent, reducing the region's share to less than one percent of world output.
- Several Asian countries, most notably South Korea and China, have been "particularly aggressive" in expanding their support for R&D and scientific development. China is now the world's fifth leading producer of science and engineering doctorates.
- Science spending as a proportion of economic output in developing countries still lags behind that of the developed world. All Latin American countries, except for Costa Rica, spend less than one percent of their gross domestic product (GDP) on R&D, compared with more than 1.7 percent in Canada.[9]

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[2] Advisory Council for Science and Technology (ACST), *A Canadian Innovation Agenda for the Twenty-First Century*, Fifth Report of the Standing Committee on Industry, Science and Technology, Susan Whelan, M.P. Chair, June 2001.

[3] Wagner, Caroline et al, *Science and Technology Collaboration: Building Capacity in Developing Countries?*, RAND Science and Technology, Washington, DC, 2001.

[4] World Bank, *Constructing Knowledge Societies: New Challenges for Tertiary Education*, The World Bank, Washington, DC, 2002.

[5] One may notice that these measurements of scientific outputs cannot assess knowledge creation resulting from social sciences research and investigation. In addition, measuring knowledge creation with IP and patent does not take into account the role of knowledge dissemination.

[6] World Bank, op.cit., 2002.

[7] National Science Board, *Science and Engineering Indicators — 2002*, Arlington, VA: National Science Foundation, 2002, available at http://www.nsf.gov/sbe/srs/seind02/start.htm.

[8] Reporting from Scidev.net.

[9] Association of Universities and Colleges of Canada, *Trends in Higher Education*, Ottawa, 2002.

Considering the lack of homogeneity in research capacity among developing countries, RAND has developed useful categories to group countries according to an index that measures national S&T investment and output using indicators such as per-capita GNP, the percentage of GNP spent on R&D, and the number of scientists and engineers per million people.[10] The following categories will facilitate our analysis. *Scientifically advanced countries*, mostly OECD members, are the 22 countries with scientific capacity well above the international average.[11] *Scientifically proficient countries* are the 24 nations with scientific capacity at or slightly above the international average.[12] Most of these are emerging knowledge economies such as Brazil and India, as well as former eastern-bloc countries. *Scientifically developing countries*[13] and *scientifically lagging countries*[14] are the remaining 104 countries in the index whose scientific capacity is below the international average.[15]

Trends in international research collaboration in Canada

In Canada, there has been a growing sense of the importance of international research collaboration in recent years, as evidenced by the release of a report on Canada's international S&T activities commissioned by the Advisory Council on Science and Technology (ACST), as well as the creation of new funding programs and policy changes at some of the research granting councils to facilitate international collaboration.[16] There has also been growing interest in international research collaboration on the part of Canadian researchers. For example, in the pure sciences and engineering, publications resulting from international collaborations as a proportion of all publications increased from 17 percent in 1981 to over 30 percent in 1995.[17] However, the majority of partnerships developed by Canadian researchers remain with scientifically advanced countries.

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[10] Wagner, Caroline et al, op.cit., 2001.

[11] Examples include the United States, Japan, Germany, Canada, and Taiwan.

[12] Examples include Singapore, India, Poland, Brazil, and China.

[13] Examples include Uzbekistan, Chile, Mexico, Iran, and Costa Rica.

[14] Examples include Malaysia, Uganda, Nigeria, Burkina Faso, and Zambia.

[15] Even in countries at the bottom of the scale, excellent science takes place in certain fields. India for example, excels in mathematics; China conducts world-class seismology research; the Philippines is an international leader in rice research; and Chile has developed strength in astronomy research.

[16] The three granting councils are: the Natural Sciences and Engineering Research Council of Canada (NSERC), the Social Sciences and Humanities Research Council of Canada (SSHRC), and the Canadian Institutes of Health Research (CIHR).

[17] ACST, *Reaching Out: Canada, International Science and Technology, and the Knowledge-based Economy*, Report of the Expert Panel on Canada's Role in International Science and Technology, 2000.

Figure 1 — International trends in research collaboration

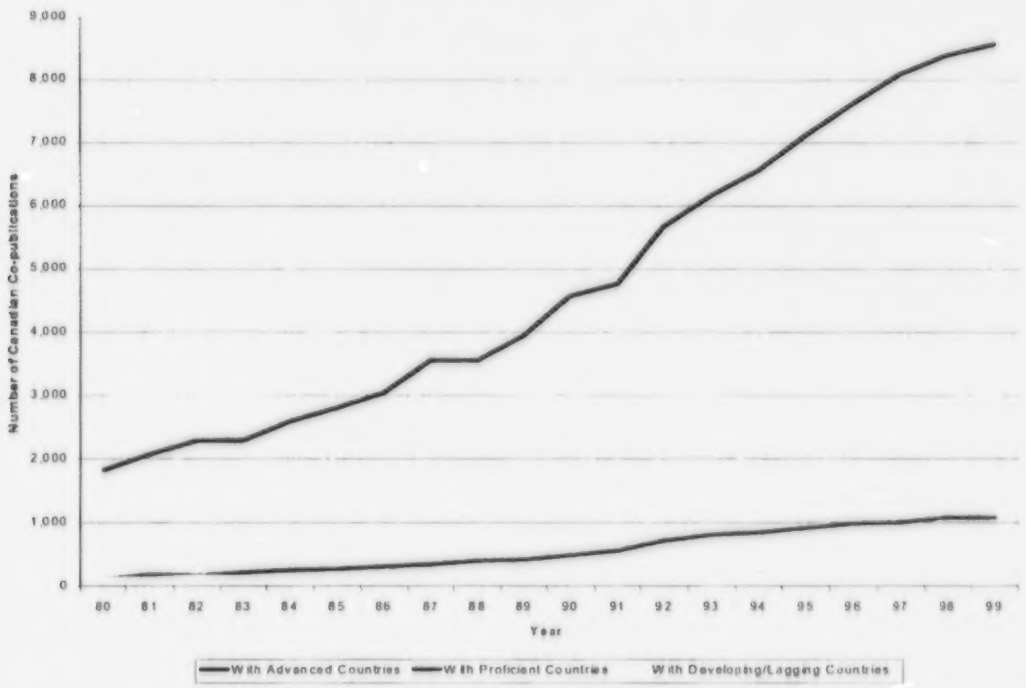


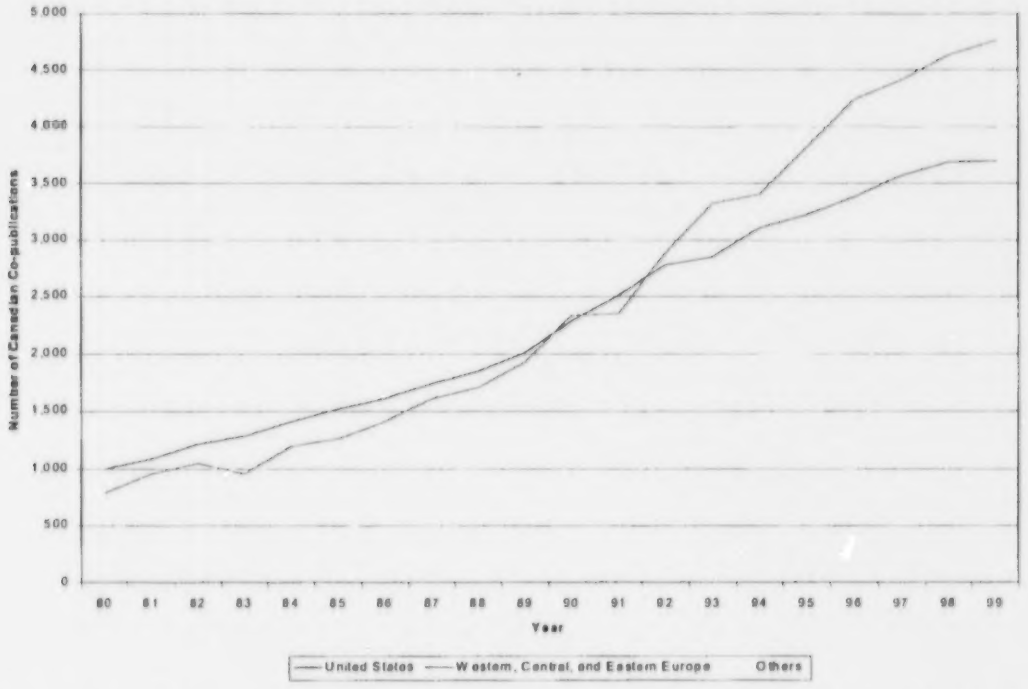
Figure 1 above shows trends in the number of publications produced by Canadian university researchers in collaboration with international partners from 1980 to 1999 according to the RAND country groupings discussed earlier.[18] What is notable is that collaboration between Canada and other scientifically advanced countries accounts for most co-publications.[19] Increases in this category have been strong, rising over 87 percent between 1990 and 1999. While collaboration with scientifically proficient countries is relatively low compared with the total volume of collaboration, the number of co-publications with these countries increased by 120 percent since 1990. Most of this increase, however, occurred between 1990 and 1995. Since 1995, increases have been marginal and the gap between Canada's research collaboration with "advanced" and "proficient" countries has been growing. Collaboration between Canada and scientifically developing and lagging countries is low (581 co-authored publications in 1999). Nevertheless, there has been a noticeable increase since 1980, especially between 1980 and 1990.

[18] Observatoire des sciences et technologies (OST), special tabulations. The OST tracks publications in sciences and engineering, but not the social sciences and humanities.

[19] It must be noted that, while a key indicator, co-publications as a measurement only captures part of the international scientific collaboration that exists between Canadian and foreign researchers.

Figure 2 below presents the same picture by geographic region.

Figure 2 — International trends in research collaboration by geographic region



While the above chart shows that Canadian university researchers have reduced their traditional reliance on the United States and have turned more to Europe, the countries of choice for collaboration continue to be in the developed world.

Looking at co-publications is only one way to measure the level of international collaboration in research. Although Canadian granting councils do not systematically track research grant spending on international activities, available information suggests that collaboration is significant in certain programs and mainly oriented toward developed countries:

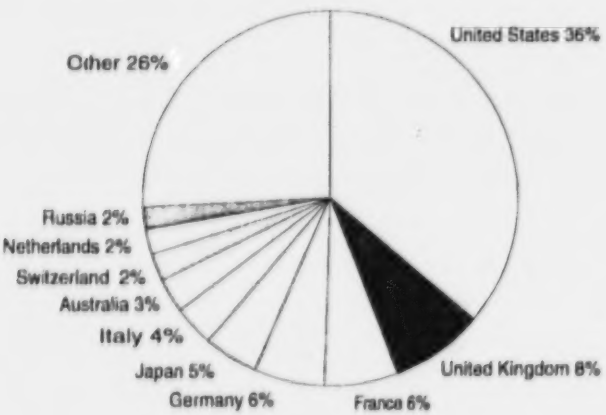
- In NSERC's Collaborative Research Opportunities (CRO) Grants program,[20] the most frequent international collaborations are with researchers in the United States, Japan, Germany, France, Italy and Portugal.
- Over 80 percent of NSERC's Post-Doctoral Fellows who choose to go abroad go to the United States.[21]

[20] The CRO Grants program supported the participation of teams of Canadian researchers in major international or interdisciplinary research projects that present a special opportunity for collaboration. On April 4, 2003, NSERC announced a moratorium on this program. It will be integrated into a new program entitled the Special Research Opportunity (SRO) program. At the time of this publication, the conditions of the SRO were not yet available. Please consult http://www.nserc.ca for more information.

- About 86 percent of foreign collaborators in SSHRC's *Strategic Themes Programs*[22] and 84 percent of foreign collaborators in the *Standard Research Grant Program* are either from Europe or the United States.
- In SSHRC's *Strategic Themes Programs*, over 33 percent of projects had at least one foreign collaborator in 1999–2000. In the same year, 26 percent of doctoral and postdoctoral fellows took their grants abroad. In the *Standard Research Grants*, however, the proportion of projects with at least one foreign collaborator in 1999–2000 was only 6.5 percent.
- Of all grant money at NSERC, 6.2 percent was spent on foreign student support in 2000–2001. In the same fiscal year, approximately six percent of NSERC Postgraduate Scholarships and over 60 percent of Postdoctoral Fellowships were undertaken at universities and research centres abroad.[23]
- Approximately one-third of post-doctoral fellows supported by CIHR undertake their training abroad.

Figure 3 below displays patterns of international collaboration by Canadian researchers according to partner country.[24] The United States is dominant, with 36 percent of all co-publications in 1999, followed by the United Kingdom with eight percent and France with six percent. Together, these three countries accounted for half of all publications produced by Canadian university researchers in collaboration with international partners in 1999.

Figure 3 — International collaboration by Canadian researchers according to partner country



[21] NSERC prepared special tabulations for AUCC.

[22] Strategic themes programs combine two types of initiatives: 1) research grants that support projects in themes selected in consultation with the research community (e.g., themes include aboriginal people, citizenship, identity and democracy, environment, and image, text, sound and technology); 2) joint research initiatives funded by two or more partners including SSHRC on strategic themes selected by the partners.

[23] Tabulations prepared by NSERC.

[24] OST, op cit.

Canada's approach to North–South research collaboration

As was noted above, international scientific collaboration in Canada is growing as a percentage of all scientific activity, and the main partners for Canadian researchers remain in other developed countries. In this third section, we will review some trends and recent changes in the Canadian approach to North–South research collaboration with a view to taking stock of the current incentives that exist within Canada to encourage a diversification of North–South partnerships.

When it comes to research cooperation with the developing world, Canada's approach can be characterized as taking place both in the context of foreign assistance and in the context of merit-based partnership collaboration. Wagner has made a useful distinction between these two types of collaborative approaches. "Research as foreign aid" programs, where funding is earmarked for research on specific countries and/or issues, tends to be top-down in its mission, focus and allocation. This type of collaboration differs from merit-based collaborative schemes, which allow the allocation of funds in a bottom-up peer-reviewed process with funds granted to scientifically excellent research, regardless of partnering arrangements made by national scientists.[25]

Research as foreign aid

In Canada, research as foreign aid is supported within the International Assistance Envelope (IAE). Funds from the IAE are divided among the Canadian International Development Agency (CIDA), IDRC and several other federal departments involved in particular development cooperation activities. In the last federal budget, the government announced an increase of eight percent, equivalent to $353 million, in the IAE for the current fiscal year, and an additional eight percent annually in each of the next two fiscal years.[26]

CIDA, the main vehicle for Overseas Development Assistance (ODA) in Canada, rarely supports basic or fundamental development research as part of its mandate, but it does fund applied research in the context of different projects and programs such as the *University Partnerships in Cooperation and Development* (UPCD) Program. The *Child Protection Research Fund* is also a good example where CIDA considered that applied research was necessary to influence policy and to identify sustainable, practicable solutions to problems facing children in need of special protection. CIDA invested $2 million in that special research fund. The December 2001 call for proposals resulted in 62 submissions and six projects were chosen.[27]

In addition, through CIDA's multilateral activities, the Canadian government has recently announced significant increases in its support for a range of research activities in Africa, including $50 million to support the work of the International AIDS Vaccine Initiative (IAVI), as well as the newly formed African AIDS Vaccine Partnerships (AAVP). Overall, the plan is to increase spending on HIV/AIDS in Africa fourfold. Support for Africa-related agricultural research will also be increased by investing an

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[25] Wagner, Caroline, op.cit, 2001.

[26] In the budget estimates for 2002–2003, the overall $2.3 billion of the IAE was divided among 1) CIDA, at $1.8 billion, 2) IDRC, at $92 million, and 3) other key departments (Department of Foreign Affairs and International Trade, Department of Finance and Health Canada), which shared the remaining $371 million.

[27] See http://www.acdi-cida.gc.ca/childprotection.

extra $40 million over three years in programs carried out through the Consultative Group on International Agricultural Research (CGIAR). The funding was announced by Prime Minister Chrétien at the end of the G8 meeting in Kananaskis, Alberta, in June 2002.[28]

The $40 million for the CGIAR network will concentrate on the needs of smallholder farmers and women producers, both identified as priorities at a recent international meeting organized by the Food and Agricultural Organization (FAO). In particular, the support will be focussed on programs in sustainable agriculture, national agricultural research systems — including African research networks — and the policy, trade and social dimensions of agricultural and food security research.[29] In addition, CIDA, in its policy statement *Promoting Sustainable Rural Development Through Agriculture*, recognizes that "knowledge — both indigenous and new — has been pivotal to agriculture's development contributions."[30] Consequently, one of the programming priorities consists in strengthening national, regional and international agricultural research and transfer capabilities.

The IDRC is the primary Canadian mechanism to support research for development and North–South research collaboration. IDRC's mandate is twofold: 1) supporting developing-country researchers to build local research capacity in their countries and 2) providing the means for scientific collaboration between Canadian and foreign researchers. With a grant from Parliament of $88 million and $47 million from other sources in 2000, IDRC dedicated about 18 percent to collaborative projects.[31] In the last federal budget, IDRC received an increase of eight percent to its budget. It is unclear at this point how the money will be allocated to support IDRC's dual mandate in research for development. Given IDRC's track record on innovative approaches, one can imagine that this agency will be looking at new ways to use its increased resources to enhance its programming as creatively and effectively as possible, including working with Canadian universities and university researchers.

A snapshot of the collaborative projects supported by IDRC reveals that about 70 collaborative projects are currently funded by IDRC, involving 20 Canadian universities, several research institutes and NGOs. Projects cover several research areas such as small-scale fisheries, reproductive health, coastal resource management, distance learning, and microfinance.

Other Canadian federal agencies are also involved in "research as foreign aid" through some problem-based initiatives. A promising development has been the creation of the Global Health Research Initiative (GHRI), a collaborative agreement entered into by the CIHR, IDRC, CIDA, and Health Canada to support research that addresses global health problems. These include the spread of diseases such as HIV/AIDS, which are a great burden to developing countries and of concern to Canadians. The agreement will serve as a framework for research projects and programs carried out in partnership

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[28] Section 6.4 of the final communiqué issued by the G8 recommends the G8 countries support "health research on diseases prevalent in Africa, with a view to narrowing the health-research gap, including by expanding health-research networks to focus on African health issues, and by making more extensive use of researchers based in Africa." See http://ww.g8.gc.ca/kan_docs/afraction-e.asp.

[29] See http://www.scidev.net.

[30] CIDA, *Promoting Sustainable Rural Development Through Agriculture: Canada Making a Difference in the World*, Ottawa, Canada, 2003. See http://www.acdi-cida.gc.ca/cida_ind.nsf/vall/ECE27220C9FA44AF85256C4D006A0B4D?OpenDocument

[31] See http://www.idrc.ca.

between the participating agencies. Research will be carried out by scientists in Canada, Asia, Africa, the Middle East and Latin America, and knowledge generated from such collaboration will benefit both Canada and the developing country. The GHRI is part of a Canadian response to addressing the "*10/90 Gap*," the fact that only 10 percent of all research and development funding worldwide is directed at supporting research on 90 percent of the world's disease burden.

In other donor countries, international research collaboration has also received a high level of attention as a strategy to enhance the research and development capacity of developing countries. For example, in donor agencies in Sweden, Norway, the Netherlands and Denmark, the point of departure for research cooperation with developing countries is that sustainable development, including the eradication of poverty, requires the development and use of knowledge. Autonomy of the Southern partners at the implementation and management levels is paramount, and the interests of donor countries do not figure into the equation. The last section will present more information on each agency's mechanisms to foster North–South research collaboration. In addition, multilateral organizations such as the World Bank have developed policies to encourage S&T as a mechanism to reach development goals. For example, the Millennium Science Initiative is an umbrella for new lending, under which the World Bank's client countries can borrow to improve their scientific and technological capacity.[32]

Partnership-based collaboration

As mentioned earlier, Canada's approach to North–South research collaboration also takes place in the context of "partnership-based collaboration" facilitated by mainstream research collaboration mechanisms. In this case, research projects are supported by Canada's three main research granting councils through specific international programs and, under certain conditions, general research grants programs. This category of funding does not fall under the IAE. Funds specifically dedicated to international collaboration programs account for only a small part of granting councils spending on international activities. It is worth noting that the programs of the granting councils do not specifically target North–South research collaboration.

Although the three councils generally phased out their dedicated international collaboration programs in the mid-1990s, NSERC has since taken the lead in creating mechanisms dedicated to supporting Canadian participation in international research collaboration. The *International Opportunity Fund* (IOF), with a budget of $1.5 million per year, and the *CRO Grants* program, whose budget is expected to reach $6 million annually by 2002–2003,[33] are respectively meant to support international networking activities and collaborative projects. In addition, the NSERC/IRAP *Collaborative Research and Development Program* links NSERC with the *Industrial Research Assistance Program* (IRAP) of the National Research Council to facilitate the joint participation of industry and university researchers in international projects.

Although there is no specific North–South research focus, SSHRC and CIHR have recently made certain policy changes to foster greater international collaboration by allowing foreign researchers to access funding. In the case of SSHRC, while principal investigators must be Canadian citizens or permanent

[32] See http://www1.worldbank.org/education/scied/projects.htm.

[33] As was mentioned earlier, on April 4, 2003, NSERC has announced a moratorium on the IOF and CRO Grants program. Both will be integrated in the SRO program.

residents, foreign researchers may now apply as co-applicants and have access to research funds for work conducted as part of the Canadian-led teams in selected programs.[34] Foreign researchers may also be brought to the research site as visiting scholars for up to three months in these programs. CIHR also recently changed its regulations to allow foreign researchers to apply as co-applicants for all its grants programs. CIHR funding, however, cannot be used to support the direct costs of foreign researchers. Apart from certain exceptions, grant money must remain in Canada. CIHR also funds international research collaboration through its international exchange programs, which allow Canadian and permanent resident researchers to collaborate with researchers abroad.

The Canadian Foundation for Innovation (CFI) has two international funds, each with a one-time budget of $100 million: the *International Joint Ventures Fund* and the *International Access Fund*. Both are designed to provide access for Canadian universities to major international collaborative programs as well as leading facilities abroad. Two of the projects selected under the CFI international funds involve collaboration between Canadian universities and developing-country institutions. These projects are in the areas of infectious-diseases research and astronomy:

- "The Canada–Kenya research laboratory aims to provide outstanding researchers in Canada — and their international collaborating partners in Nairobi, Oxford and Washington — with a state-of-the-art facility for research on highly infectious diseases such as AIDS and hemorrhagic fever;"
- "The Canadian access fee to the Atacama Large Millimetre Array (ALMA) Telescope — a major international construction to be based in Chile, which will be the foremost land-based instrument over the next 20 years."[35]

Interest in dedicated international collaboration programs is strong. The CFI's international funds, for example, received 72 project outlines, requesting over $1 billion. Of these 72 outlines, only five projects under the *Joint Ventures Fund* and 13 under the *Access Fund* were invited to submit full proposals.

Trends in support of North–South research collaboration in the United States and Europe

To inform the roundtable discussion, it is instructive to look at different policy frameworks and trends in international research collaboration with the developing world in other OECD countries. In this case, we will examine particular issues in the United States and Europe. Many of the observations in this section are based on notes from meetings and interviews conducted in spring 2002 with key officials in the American and European governmental and scientific communities involved in international S&T issues.

The United States

In the United States, the American framework for international collaboration in research appears to be strongly influenced by the security agenda. While the security agenda is influencing how American research agencies now view international cooperation, it is also a vehicle for forging interagency cooperation where none existed before.

According to the most recent statistics available, the United States federal government spent

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[34] See http://www.sshrc.ca.

[35] See http://www.innovation.ca.

approximately $4.4 billion US on International Cooperation for Research and Development (ICRD) in 1997. This amount constituted about 6 percent of the total federal R&D budget of $72 billion. It is interesting to note that most of these funds were dedicated to international collaboration research supported by the National Aeronautics and Space Administration (NASA). In 1997, NASA spent approximately $3.1 billion on projects relating to ICRD through its programs on earth science, space science, life and microgravity science, aeronautical research and technology, academic programs and contracts. Other collaborative projects accounted for about $1 billion of 1997 spending. The largest partners were Russia, Canada, the United Kingdom, Germany and Japan. Funding for bilateral cooperation with Russia dominated at more than $390 million.[36]

The State Department now considers S&T to be a key element of foreign policy. The Secretary of State appointed a science adviser who has been active in representing American S&T diplomatic interests abroad. Indeed, Colin Powell's speech to the National Academy of Sciences (NAS) in April 2002 offers a signal that the State Department is considering international S&T quite seriously.[37] NAS, which triggered the debate in this matter in 2002, is also working with the United States Agency for International Development (USAID) to develop a study on how to get the international development and research agenda more focussed in foreign policy. USAID is also facing an important challenge as it develops a strategy for S&T cooperation and prepares to receive a large amount of the $5 billion US that President George Bush has committed for development assistance.

Despite an increased level of activities that are highly focussed on specific problems and issues of national security, international S&T collaboration, particularly with the developing world, remains a poor cousin of the more traditional foreign, trade and aid activities. International S&T collaboration with developing countries remains ad hoc and little coordinated. Furthermore, the bulk of the activities happens first with developed countries, then with newly industrialized economies and finally with low-income developing countries. For instance, Korea, Mexico, Israel, China, Brazil and Russia receive the lion's share of attention.

The American Association for the Advancement of Science, the National Science Foundation (NSF), and the Office of Science and Technology Policy (OSTP) are all re-visiting their approach to international S&T.[38] The NSF, for example, is taking into consideration that research excellence must be viewed from a slightly different perspective when reviewing work with the developing world. For this reason, the NSF has adopted two standards for review: merit and broader impact of the research.

The European Union

When one looks at the international research framework in the European Union (EU), what stands out is that the EU has developed integrated policies to drive research collaboration in large part to develop scientific excellence in Europe and raise its profile in the world. The Sixth Framework Programme

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[36] Wagner, Caroline, Allison Yezril and Scott Hassell, *International Cooperation in Research and Development: an Update to an Inventory of U.S. Government Spending*, RAND Science and Technology, 2000.

[37] Remarks to the 139th Annual Meeting of the National Academy of Sciences, April 30, 2002, available at http://www.nas.edu.

[38] National Science Foundation, *Toward a More Effective Role for the US Government in International Science and Engineering*, Arlington, November 15, 2001, available at http://www.nsf.gov.

(FP6) 2002–2006 is the EU's main instrument for funding research in Europe. Its overall budget of 17.5 billion Euros represents an increase of 17 percent from the Fifth Framework Programme (FP5). FP6 focusses on seven key areas: genomics and biotechnology for health, information-society technologies, nanotechnologies and nanosciences, aeronautics and space, food safety, sustainable development, and economics and social sciences.[39]

FP6 seems to be more "Europe-oriented" than FP5. Its goal is the creation of a European Research Area (ERA), with research capacities across Europe more integrated than they are now. Networks of researchers will be created, making FP6 projects bigger and more expensive than they were under FP5.

The proactive approach is reflected in the four ERA priorities:

- making the ERA more attractive to the best scientists and making it a world-class reference centre;
- enabling European researchers and industrialists to access the knowledge and technology produced outside Europe and also the experimental fields needed for European research;
- integrating S&T into the implementation of EU foreign policy and development aid;
- enlisting the scientific and technological resources of the EU and of third countries in initiatives linked to significant world problems or health and major diseases connected with poverty.

The main avenue for research cooperation with developing countries under FP5 was the International Scientific Cooperation Programme (INCO), the successor to a number of research-for-development programs first established in 1983. Under FP6, funding for INCO partner countries has been partly mainstreamed into the thematic priorities including NEST and SMEs to actively enable their participation. A budget envelope of 285 million Euros is dedicated to fund third countries that wish to participate under these priorities. In continuation of the original INCO under FP6, another 315 million Euros are allocated for specific measures in support of international cooperation targeting activities not covered by the seven priorities, but linked to the specific needs of the target countries. In addition, all of FP6 is open to third countries that wish to participate, provided they pay their own way. FP5 was nominally open, and no money was set aside for third countries to participate.

The budget envelope of 315 million Euros will be divided among the four INCO target regions: Developing Countries, Mediterranean Partner Countries, Western Balkan Countries, and Russia and the other New Independent States (NIS). In order to account for their specific needs, annual calls for proposals are managed on a region-specific basis or according to the priority areas established by Council Decision, and refined through biregional dialogue and European commitments in international fora. Much of the research funding for Russia and the other NIS is being managed through INTAS.

As for the 285 million Euros that can only be used to fund third countries[40] to participate in the thematic priorities,[41] countries with a reasonably functioning research infrastructure will find it easier to be

[39] For more information see http://europa.eu.int/comm/research/fp6/index_en.html and http://fp6.cordis.lu/fp6/home.cfm.

[40] INCO target countries and OECD countries, if this is specifically mentioned in the work program and indispensable for the success of the project.

[41] Allocation on a pro-rata basis for all seven thematic priorities and NEST and SMEs.

included in consortia on research themes of a more global scope (food safety, poverty-related diseases, etc.). Nevertheless, emerging economies such as India or China might find these themes useful. The new instruments such as the *Networks of Excellence* and *Integrated Projects* might prejudice the participation of certain developing countries, given the focus on large and expensive projects and the fact that they will be dominated by European research teams. Some thematic priorities take a markedly more proactive attitude than others by creating explicit openings for international cooperation, for example, water themes in the environment priority. The mid-term review in 2004 will show to which extent the concept of opening ERA internationally has worked.

Nevertheless, other encouraging signs include the overall priority of genomics and biotechnology for health where, for example, poverty-related diseases have received considerable attention. The first phase of the European–Developing Countries Clinical Trials Programme (EDCTP), a new program to accelerate the clinical development of drugs and vaccines against poverty-related diseases, is about to be launched. The Commission has proposed to contribute $200 million to this initiative under FP6.

Under the FP6, the EU has established two new fellowship programs that will facilitate research collaborations and exchanges between Europe and other countries like Canada. The *Marie Curie Outgoing International Fellowships* will enable Canadian researchers to invite European colleagues to Canada for up to two years, and the *Marie Curie Incoming International Fellowships* will allow Canadian researchers to spend up to two years working in European research centres.

In addition, as noted in the third section, when it comes to "research as foreign aid," several European development agencies look at research cooperation as an appropriate target for ODA funding. For example, the Swedish development agency, SIDA, through its Agency for Research Cooperation with Developing countries (SAREC), plans and implements its research focus along with its action programs and sector policies. According to SIDA, positive and sustainable development requires the development and use of new knowledge. Internationally available knowledge can only provide a modest contribution to sustainable development. It also requires the development of knowledge with and within the developing countries.[42]

The United Kingdom's Department for International Development (DFID) has recently revamped its research for development policy to untie its support to research, thus allowing institutions located outside of the UK to bid on research projects. This policy shift is so recent that it has not yet led to any major changes in the range of institutions undertaking DFID research, but it will be important to monitor the impact of this new approach on North–South collaboration in the British context.[43] DFID has also centralized a large part of its research activities to optimize its research effort.

Another good example of this European trend to support international research collaboration in the context of foreign assistance is the Netherlands. Dutch development policy was revamped in the early 1990s and one priority became development research. The thinking behind this policy shift was that

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[42] See http://www.sida.se.

[43] Surr, Martin et al, *Research For Poverty Reduction: DFID Research Policy Paper*, November 2002, available at http://www.dfid.gov.uk/Pubs/files/pov_red_pol_paper.pdf.

much development assistance in the South was dominated by donors and the Northern research community, and little of the research funded in the South had relevance for local people. The most illustrative example of the new thinking on research and development policy is the Multi-Annual, Multi-Disciplinary Research Program (MMRP), a program funded by the Ministry of Foreign Affairs. The first such program was established in 1993. The goal of the MMRP is for Southern partners to formulate their own research project proposals, use participatory research methodologies, organize, administer and manage projects, and disseminate their research results. The highest priority is given to capacity building in the South and South–South networking.

The *Norwegian Council for Higher Education's* program for development research (NUFU), funded by the Norwegian Agency for Development Cooperation (NORAD), as well as the Danish *Bilateral Program for Enhancement of Research Capacity in Developing Countries* (ENRECA), funded by the Danish Ministry of Foreign Affairs (DANIDA), share similar policy orientations with the Netherlands in terms of their activities related to research-capacity building, although there are some variations within each agency with respect to the role of Northern partners and the degree of autonomy given to Southern partners. NUFU considers also that research and educational cooperation between countries in the North and the South are important because the universities in the South act both as a driving force and as a critical and independent voice in the development of society.[44]

Conclusion

This paper was developed as a backgrounder for a national roundtable organized in Ottawa in May 2003. This roundtable is intended to initiate dialogue on strategic opportunities, challenges and operational issues related to Canadian research collaboration with partners in the developing world. Certain trends in the pattern of international research collaboration have been highlighted in this document.

First, a closer look at the state of science in the developing world revealed a heterogeneous situation. Developing countries have achieved various levels of S&T capacity and this influences their ability to develop partnerships with Canadian researchers. The picture that emerges is uneven, both across and within regions. This heterogeneity ought to be taken into account when designing a policy framework for research collaboration with the South.

There have been some shifts in patterns of collaboration involving Canadian researchers and foreign collaborators. Notably, there has been a clear increase in the volume of international research collaboration as measured by the growing number of co-publications involving Canadian researchers and foreign partners. However, this increase is mainly with OECD countries. That said, although Canadian research collaboration with developing countries represents a small portion of the overall Canadian international scientific collaboration, there has been a significant increase in the last 20 years. For example, collaboration with "scientifically proficient countries" increased by 120 percent. We have also noted that collaboration is driven by a number of factors, including motivation to conduct "problem-based collaboration" where scientific knowledge is applied to issues that have a global impact.

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[44] Norwegian Council for Higher Education, *The Norwegian Council for Higher Education's NUFU Programme: Strategic Plan 2001–2005*, available at http://www.siu.no.

Third, within OECD countries, no clear overarching trends or patterns emerge as to how they are approaching North–South research collaboration. A look at other countries shows that their approach is driven by several elements such as the security agenda and, in the case of the EU, an interest in strengthening research expertise and its international profile. Several European countries have integrated North–South research collaboration as an element of their overseas development agenda.

Finally, there is a discussion in some countries around the criteria to measure excellence in research. In developing selection criteria, the broader impact of research is considered as well as scientific merit in the selection of research projects.

In closing, we hope that the facts presented in this backgrounder, as well as the observations of emerging trends and issues, will stimulate important reflections in the Canadian context for future strategies to strengthen our approach, both at the policy and institutional levels, to research collaboration with developing countries.

MAY 2003

RESEARCH WITHOUT (SOUTHERN) BORDERS

NEW DIRECTIONS IN INTERNATIONAL RESEARCH IN CANADA

A SUMMARY OF THE ISSUES BASED ON REPORTS FROM THE CAMPUS ROUNDTABLES ON THE INTERNATIONALIZATION OF CANADIAN RESEARCH

IDRC CRDI

Background

Between October 2002 and February 2003, 14 universities,[1] responding to an invitation from IDRC and AUCC, organized campus-level meetings to discuss the internationalization of Canadian research with an emphasis on the opportunities and challenges of increased collaboration with researchers and institutions in the developing regions of the world. In the order of 310 individuals participated in these roundtables.

All of the campuses provided reports of their event. These ranged from point-form minutes to a longer report from one campus where a consultation and meeting had been conducted as a "group consultation project" for a senior undergraduate course in development studies.

This summary is an attempt to share the "issues" that were identified in the campus-level roundtables — offering a heading to capture the point and brief text to convey why participants thought it was worthy of further consideration. Efforts to "sort" the headings demonstrated that there was no ready classification given the overlaps across the list of issues.

To quote from one of the reports,[2] the guiding question for the campus-level roundtables was: *As commitments to the internationalization of research intensify across universities, are issues and peoples of marginalized / developing communities, institutions, countries, and regions figuring in this research?*

Now is the hour

There was strongly shared agreement across the land that this was a good time to raise the issue and get the challenge and opportunities out for discussion. Many of the campuses were in various stages of dealing with the international dimension of their strategic plans. And more funding is being made available for Canadian-led research from the granting councils and through new structures (CRC, CFI, Genome Canada).

Who is interested?

On several campuses there was (pleasant) surprise at just who was interested enough to attend the event; not just the "international development types" (the usual suspects), but also researchers working on problems that contribute to development but who do not think of themselves as involved in "aid." Several campuses indicated that they would convene the group more frequently to take stock and share because this awareness of who the allies might be offered a tactical advantage by uniting actors at all levels of the university (students, faculty and administration), to influence the direction of internationalization within the institution.

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[1] AUCC and IDRC acknowledge and thank the organizers and participants of roundtables held at U of Calgary, U of Saskatchewan, York U, St Mary's U, Ryerson U, U Regina, U of Ottawa, Dalhousie U, SFU, UBC, U Laval, U Victoria, U Windsor, U Toronto.

[2] Individual reports have been quoted or paraphrased without attribution.

Speaking to the converted

Reports underscored the fact that the participants at the campus roundtables were the converted and that their constantly saying that research for development is a "good thing" was not enough. Supporters have to be prepared to answer the hard-edged question — What's in it for Canada?

But the virtue of international/global/universal reach does not have to be sold to the universities; it overarches the university's raison d'être — teaching, research and service. However, the devil is in the details.

What's in it for Canada?

Participants are very aware that research and research funding are increasingly negotiated within meshed scholarly and business frames of reference. The emphasis is on "Canada-first" research [research that makes Canadians healthier, wealthier and safer in a competitive world]. For the domestic sources of research funding (tri-councils, CRC, CFI, etc.), any move to increase collaboration with developing-country researchers must answer the business question: What's in it for Canada? The increased interest in research collaborations with India, China and Brazil that are not linked to aid are indicative.

How much more should Canada be expected to do?

Because Canada puts 40 percent of its aid budget through multilateral organizations, it is making a substantial — though hidden — contribution to research for development. Discussing the possibility of co-opting other sources of national research funding for international research for development is not attractive to those who consider Canada provides inadequate support for Canada-first research.

What's in it for me? (Can I achieve career and professional advancement?)

This was by far the most often discussed issue across the campus roundtables — often referred to by the shorthand "progress through the ranks" and as the "faculty reward and support system." Many features of research for development are considered career limiting — mostly because this type of research is perceived to limit the quantity and quality of published research, which is especially critical for tenure and promotion. Sole-author research is still most highly regarded.

Primarily because it is done "off shore," research for development is characterized as:

- costly in money and time;
- inconvenient in that it means arranging time out from teaching;
- requiring a facility with foreign languages;
- contentious if foreign collaborators insist on control of the research by virtue of their ownership of the research site;
- not rigorous;
- slow moving and not leading to publishable quality if the collaborator is weak.

Although one university may make changes to the standard for tenure — willingness to include research for development, teaching, training and service — if these depart too far from generally accepted standards faculty may find they are not competitive if they wish to move to other universities.

The problem is deemed more acute for the natural sciences and engineering faculty, who are held to rigid disciplinary standards and expectations with respect to the minimum time to progress in career terms. The result is that these disciplines are discouraged from seeing research for development as integral to their research and teaching careers. They are restricted to consulting opportunities and community service.

Although Project Reports do not have the cachet of the journal article, they may have greater impact on the lives of millions of people. How does one determine the merit of the research on which these reports are based?

Universities want research linked to teaching. Research can gain recognition when it is contributing to the curriculum. Departments that discourage research for development because they see no link to the curriculum do the faculty and the university a disservice. With few exceptions, the challenge is for departments to be more open to how "what they teach" and "how they teach it" (and therefore research) contribute to development.

The universities and the donors need a clear definition of "productivity" — preferably a broader definition of productivity that can deal with the cost, time requirements, nature of the output, and other factors that characterize research for development. For younger academics, credit might be given for "work in progress" and not strictly for neat packages and published research. There has to be credit given for the larger, broader audience (not just other researchers) that the research will reach.

With the universities dealing with a number of issues (decreased resources, larger classes, aging infrastructure), criteria for tenure and promotion have tended to become more conservative. The single-author, peer-reviewed publication is the widely accepted gold standard. There is little appetite to take the time to devise performance measures that will take more time to evaluate.

For the social scientist, a $5,000 grant from SSHRC is likely to be better for promotion than a $25,000 from IDRC or CIDA.

What's in it for the academy?

For the academy, internationalization most often refers to students coming to Canadian universities, to the movement of new ideas, to different opportunities for faculty members to conduct research abroad. But it is more than people going here and there. Within the academy, internationalization must reflect historical and contemporary movements of people, knowledge and capital across borders.

The notion of research for, or on, development was highly contested. However, it was widely agreed that the current international research taken up by universities has little to do with development, that is, "applying abundant resources to the betterment of the world," "reducing poverty" and "serving the interests of the majority in the form of global public goods."

Universities' internationalization strategies must commit more systematically to poverty reduction as opposed to internationalization, acknowledging the transnational and transcultural contexts within which universities are operating.

"Helping them help themselves" is the slogan of development aid. Is this really what we should be doing in terms of research for development? Is it not more about bringing knowledge from developing countries into the global knowledge base, in order to make us in the industrialized societies better understand their issues and incorporate this knowledge into our decision-making processes?

International research is attracting a range of actors from NGOs to corporations. Can the academy retain pure research models and make room for applied research, where funding sources and faculty members are not necessarily the leaders guiding the research?

New opportunities — missed opportunities

Do the new innovative forms of support for research in Canada (CRC, CFI, Genome Canada, Canadian Foundation for Climate Change and Atmospheric Sciences, Canada Learning Institute) offer new opportunities for Canadian researchers to collaborate with Southern researchers on terms of greater equality? Or will the status quo cause us to miss the opportunity? Who will provide the leadership to fully exploit the potential of these developments on the Canadian research landscape?

The CRC program is seen as an opportunity for the universities to lead, using one of the chairs to establish a chair around global development issues. This need not be solely a social science or humanities chair. The potential of the natural sciences to contribute to global development is worth exploring. A chair leading a mix of social-science and natural-science research would be truly innovative.

A new opportunity cost

Under new policies the tri-councils will fund the indirect costs of research. A university's share of this new funding is pegged to its success in tri-council applications for research grants. The more successful a university in winning tri-council research grants, the greater its share of the funds for indirect costs. The university pays the opportunity cost when researchers choose to allocate their time to research that is not funded by the tri-councils (for example by IDRC, World Bank, CIDA). This research is not eligible for indirect costs and seldom permits an overhead sufficient to cover all of the university's costs. Under this new feature of research funding in Canada, the university faces a disincentive to encourage faculty to pursue research for development.

The stamp of approval

There is the perception that for Canadian academics to get career recognition they have to win research grants from one or more of the three granting councils. The need to win these grants is paramount in the early stages of an academic career. As a result, there is little interest in seeking other (less recognized) sources of support.

The neoliberal ethos is another constraint on researchers. In recent years many foundations have taken as axiomatic the link between capitalism and democracy that critical researchers take as problematic. Researchers who challenge the dominant ethos find that prominent foundations will not fund them, prominent professional journals will find their academic papers unprofessional, and lucrative consultancies are not forthcoming.

Insider trading

The university authorities are discouraged at the lack of use of what information services they provide researchers in the hunt for research support.

The fact that faculty view the seeking of research grants as a measure of their personal effectiveness means that they are not likely to look to the university authorities for help.

Faculty have very particular knowledge of where to look for funds. Without a broader view of the opportunities, they miss potential sources of funding.

Faculty are reluctant to share knowledge of funding sources, thus limiting the competition that would jeopardize their career prospects.

Why the shift in view point — from "international research" to "global research"?

A quote from York University's Internationalization Task Force captures the shared sense that the context for international research is changing. With increased globalization, the well-being of Canadians is linked to global concerns, suggesting that the greater part of modern research could be characterized as "research for development."

> A somewhat static concept of international focusses on that which is "between nations," the notion of "abroad," "out there." [...] we are persuaded that a more evolutionary understanding of international involves the recognition that the "there" is in fact intimately bound with the ongoing shaping of our "here." [...] Thus, we believe that it is useful to position our international activities in more inclusive notions, which also recognize the rich presence of the international, the diasporic and the transnational in Canada and elsewhere. This means going beyond a "one-way" study of a country or "area" from the Canadian perspective. [...] This approach appreciates the implications for and in Canada — enabling a dynamic, mutually shaping and intricately responsive, *triangular system*: a nexus of the global, the Canadian and the local. Our use of "international" [...] is meant to capture and reflect this complexity, its cross-cutting issues and its challenges — and its resulting implications for the design of [...] curriculum and research.[3]

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[3] *Moving Forward the Internationalization of York*, Report of the Senate Academic Policy and Planning Committee (APPC) Task Force on International Activities at York. It is available online at: http://www.yorku.ca/secretariat/senate/committees/appc/international/movingforward.htm.

From altruism to strategic alliances

The first consideration or incentive for seeking research collaborations is that they are strategic alliances to gain access to peers and to facilities not available at home. These favour pure research alliances linked to considerations of career enhancement. To date collaborations in research for development have been altruistic responses driven by moral imperatives rather than strategic alliances. Pressing global problems are converging the altruistic and moral imperatives.

The research-intensive universities of Canada will be the bellwether for this convergence.

Old money and new money: Funding for higher education

Although there is new and increased funding for the granting councils and for special structures (CFI, CRCs, Genome Canada), the core (old) money for teaching and infrastructure that was taken out of the universities to reduce the national deficit is not being replaced.

[The February 2003 federal budget may have partially addressed this issue with the funds for the "indirect costs for research" and the "Canada Learning Institute."] .

Who makes the decisions?

a) Institution versus the individual

To be eligible for much of the new funding (CFI, CRC funding), universities have to write strategic research plans and these often include increased internationalization.

The university institution may declare support for greater internationalization in its plans and policies but in reality — because of the sanctity of academic freedom — the decisions on what research gets done is the prerogative of the individual faculty member. Faculty make the decisions and take the risks — which are measured in terms of what their peers recognize as good choices and good work for advancement and recognition.

b) Donor policies

Donor policies can restrict and limit international research. The CIDA UPCD program is wary of research that may reduce resources for capacity-building activities. The granting councils want their funds used primarily by Canadians for Canadians. IDRC protects the role of developing-country researchers and keeps Canadian collaboration to a minimum.

These policies limit the possibility of attracting "scientists" from their labs to engage in research for development.

[Participants generally seemed unaware of recent changes in some SSHRC and CIHR programs to provide funds for international partners.]

There was a call for greater coordination among the set of Canadian agencies around international research opportunities that extend Canada into a global world. A national coordinating body for research funding would take a global view, advising on how to reconcile the need for "Canada-first research" with research needed for global development.

An overview function is also needed to promote flexibility, partnerships, networking, communities of practice, and new models of research that recognize that international research is more complex, riskier, expensive, time consuming.

[The SSHRC CURA grants are held up as an example of innovative research that has helped to combine the research and service missions of the university close to home (communities).]

c) Setting the research agenda

Faculty make the choice of what research to do. Because the university condones this, there is a discomfort when research is specified and directed by agencies. (IDRC is seen to do this.) This is regarded as contract work more than academic or scholarly research and as such is less highly valued for career purposes.

The work is seen as "case study" work with little or no opportunity (through donor support) for the more highly valued comparative research.

There is disagreement over how readily work on development projects can be tapped for academic publication. One view is that it takes only creativity on the part of the faculty member. But another view suggests that there are critical inter-departmental differences over what constitutes "real research" that have to be negotiated when tenure and promotion are at issue.

d) Setting standards

Is the Canadian (Northern) definition of excellence axiomatic/ sacrosanct/ a universal constant? Is it strictly linked to performance standards established by a discipline (more often than not a natural sciences discipline)?

Is there scope for seeing the definition of excellence as more open ended and determined by the nature of the problem / challenge that research proposes to address?[4]

When deciding what knowledge is needed, the South is inadequately represented. What kind of knowledge is needed to address the challenges of globalization? Are there different kinds of knowledge? What is "local knowledge"? Does it have value in a global world?

We may need an expanded definition of scholarship to better suit our times — one that takes stock of how research contributes to the world as we find it. There is a matching need for donors to value scholarship as a contributor to knowledge for development even when it does not generate immediate usable results (tools).

[Is Stiglitz[5] right to be concerned about the North's (unrecognized) ideologically linked knowledge?]

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[4] See: We may need a new definition of 'research excellence. Maureen O'Neil, Opinion Piece. University Affairs, April 2002.

[5] Knowledge for Development: Economic Science, Economic Policy and Economic Advice, Address to the World Bank's 10th Annual Bank Conference on Development Economics (ABCDE) by Joseph Stiglitz, Senior Vice-President and Chief Economist, The World Bank, Washington, D.C., April 20, 1998. See in particular the sections on policy advice.

e) Project versus programs

Project-size bits of research — which is the case for most development research — works against contributing knowledge to a field (to a critical mass) and so is less valuable for career advancement.

f) The power of the funder

Although we seek more equitable forms of partnership and truer collaboration, most rules for research funding give the prerogative of the final decision (veto) to the funder. Northern principles of accountability will resist concessions; therefore, North–South partnerships or collaborations must be sensitive to this reality.

g) Whose ethics?

The ethics of doing research in (and with) developing countries is becoming an increased cause for concern. Canadian researchers (universities) are learning to work under the new tri-council rules for research ethics.

The "one-size-fits-all" approach to ethics is seen as problematic. The approach removes ethical questions from a local knowledge-based approach to a more centralized one with ethical questions generated and monitored in a highly centralized fashion. This is seen as impeding researchers from investigating the realities of the most vulnerable and most marginal people in developing areas.

There is increased awareness of ethical issues surrounding the placement of Canadian students in developing countries, with a growing discomfort with our rich students "mining" these overseas learning experiences with no means to reciprocate by opening Canada to poor developing-country students.

[It was pointed out that seldom do donors include in their scholarships for foreign students the funds to enable the faculty to meet with the students in the field.]

In a couple of the CRCs, it is clear that access to Southern data is critical for successful research but leaves moot the question of reciprocity.

Will the concern for ethics perpetuate colonial/imperialist relationships? How are power issues and relations of participants in the research process to be engaged?

All international partners are not equal

Given a choice, faculty will favour international collaborations with OECD countries where individual researchers, facilities, etc. offer something to Canada and all conditions are more or less the same as if one were working with other Canadians.

When calendars clash

The academic year and, therefore, the scheduling of research and the cycle for promotions is fixed — between the start of the fall term and the end of the spring term. This can cause problems with the more fluid and uncertain scheduling of research programs that require periods away from the campus — and where research must be timed to the (growing) seasons and schedules of researchers in the South.

The generation gap

An aging professoriate will retire over the next 10 years — about 40,000 new faculty have to be hired. Older, tenured faculty could get involved in research for development because they had passed all the tests. A new generation — seeking tenure and "progress through the ranks" — will avoid research for development unless it is recognized and rewarded.

At a time when the executive level of the university is committing the institutions to increased global reach, the younger faculty will not respond unless the incentives match the rhetoric and unless research opportunities and funding are available.

Donors are not indicating any awareness of the need to "bring along" a new generation of Canadian scholars engaged in research for development.

The information gap / intellectual property

Researchers in developing countries have very unequal access to sources of information — it is a tangible measure of their poverty and lack of capacity.

This is one of the problems that Canadian universities — at the institutional level and the individual faculty member level — can address through the new information and communications technologies. But issues around intellectual property — ownership and profits — are a complicating factor.

Graduate students

Graduate students are the future. What they do in terms of international research will determine whether the status quo rules or whether new approaches come with the change of the old guard. The status quo is hard to break.

The burden of change (and therefore risk) is placed on individual faculty members. They are challenged to use their prerogative — their relationship with students, etc. — to foster change.

Foreign students

The foreign-student factor is complex: foreign students are recruited as a business opportunity, but they are also a window on the world, enriching the teaching and other aspects of campus life for Canadians.

The best foreign students will demand relevant education, which requires links with their home countries' future. They are not well served when they are obliged to research issues connected with Canada's future. Why wait for the confrontation — it would be more strategic to anticipate this demand and meet it. Those universities who make this move will have the edge in recruiting graduate students — combining the business dimension and the enrichment of the curriculum.

Canadian immigration policies "support taking the best from elsewhere" (favouring students educated in Canada). Universities are concerned that when they train students from the South they will be contributing to brain drain. They feel dammed if they don't (train students from the South) and dammed if they do (train students who don't go home).

A longer-term research relationship valued by the universities and supported by the donors might be one way to counteract brain drain.

[The twin-site program used by the Association of Commonwealth Universities, where students from the South register for graduate degrees at home but spend time in the UK with specialists, was offered as a possible mechanism for Canada to emulate.]

Students and faculty without Canadian citizenship are often restricted from competing for federal funds. This reflects outdated international development prescriptions that students come to a university / "developed country" to gain knowledge and should return to their own community / "developing" country to transfer that knowledge. By contrast, there are fewer constraints on funding opportunities for international students in the United States. Such policies better reflect the current hybrid movement of people and a longer-term view that knowledge will move and grow. These policies translate into an enhancement of the type of research undertaken and universities' own research and teaching of transnational and transcultural phenomena.

Natural sciences versus social sciences

The majority of funding for international research focusses on science and technology. Should this be challenged? The natural sciences have established the benchmark for international research collaboration based on strong disciplinary research that focusses on access to international facilities and collaboration around "big" (expensive) science. They receive a larger share of the innovative new funding (CRCs, CFI, Genome Canada). A lack of research in these areas is not the problem. Global problems such as poverty, deterioration of basic services, ethical relations with indigenous peoples, and political stability are problems that will not be done by Bell labs.

The social sciences are obliged to compete using natural-sciences rules to establish their contribution to international research. This constrains the contribution social science can make through its proven research methods — action science, ethnography, etc.

The natural sciences are required to find matching funds to be eligible for many research grants. Who will match these funds for social-science research with marginalized peoples and institutions?

Public versus private

The increased internationalization of research is heightening the competitive nature of research, placing greater emphasis on intellectual-property issues. Who will researchers / universities trust to join them in the creation of knowledge that bestows economic advantage and how will the intellectual-property rights be shared?

The universities are less clear about their role as producers of knowledge as a public good when they know they can produce knowledge with a commercial value and seek research partners accordingly. OECD partners are favoured.

The security factor as an element of critical research is changing the rules for collaboration — restricting it to "friends."

Will it really matter?

The debate on international / global research focusses on ways and means of overcoming shortcomings — moving to more "equal" collaborations and partnerships, valuing local knowledge, recognizing standards different from those used in the North. Will the current structure of the global political economy make room for knowledge from the South (local knowledge), Southern perspectives, enabling Southern intellectuals and institutions to play a decisive role in global affairs? This would require the North to cede influence.

Some see the shift as inevitable and argue that recognizing this in advance of being forced to accept it is one way to ensure that the North will continue to be considered a player as global economic power shifts, for instance, to Asia.

In contrast there does seem to be a growing interest in accessing knowledge from the South (CIHR, SSHRC policy changes, several CRC research programs). Why this shift? Are we increasingly sensitive to the fact that some of the answers we seek or need may be found only in Southern settings? Is this move a sign of more open collaboration or a defensive measure (know the enemy)?

Has anyone surveyed Southern researchers to learn what they think about the North's increased concern and willingness to factor Southern research and knowledge into our Northern world?

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La recherche sans frontières

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